THE BUILDER

VOL. C.—No. 3568. JUNE 23, 1911.

CONTENTS.

	PAGE
Some Forgotten Books, and a Family of Architects (with Illustrations)	769
St. Paul's Bridge and the Institute of Architects	773
Notes	774
"Si Monumentum Requiris:——?"	775
The Architectural Association Silver Medal Drawings	778
Norwich Union Buildings, Cambridge (with Illustrations)	779
London and Provincial Bank, Ltd., Norwich Branch (with Illustrations)	780
Competition News	780
General News	781
Fifty Years Ago	781
Editorial Summary	782
Meetings	782
Correspondence	782
Intercommunication Column	782
Notes to Illustrations	782
Monthly Review of Engineering:—	
Festival of Empire Buildings, Crystal Palace (with Illustrations)	783
Reinforced Concrete in Buenos Aires Port Extension (with Plan)	785
The Loetschberg Tunnel (with Illustrations)	785
The Latest Skyscraper	786
Notes	787
The Building Trade:—	
Ladders and Ladder Scaffolds (with Illustrations)	788
General Building News	790
Projected New Buildings in the Provinces	790
Minor Domestic Architecture of Yorkshire (with Illustrations)	791
Books	794
Metropolitan Asylums Board	795
Law Reports	795
London Councils	795
Foreign and Colonial	796
Trade Catalogues	796
Some Recent Sales	796
List of Competitions, Contracts, etc., Open	797
Prices Current	798
Tenders	799

Illustrations.

The Columbarium of the Crematorium, Golder's Green. Sir Ernest George, A.R.A., and Mr. A. B. Yeates, F.R.I.B.A., Architects.

The Concert Hall, Royal Academy of Music. Sir Ernest George, A.R.A., and Mr. A. B. Yeates, F.R.I.B.A., Architects.

Competition Design for Brighton, Hove, and Sussex Grammar School: Design placed Second. By Mr. Edwin Cooper.

Male Prison, Cork, 1818.
By James & George R. Pain.

SOME FORGOTTEN BOOKS, AND A FAMILY OF ARCHITECTS.

PERHAPS the dullest epitaphs that ever were written are to be found in the paragraphs describing the careers of men of second-rate importance in biographical dictionaries. So far from keeping alive the memory of their subjects, which surely should be the chief purpose of an epitaph, the frigid way in which they set out scanty facts rather seems to raise a monument to oblivion itself. To learn from the "Dictionary of Architecture," for instance, that a certain architect, whose name one has never heard before, designed certain buildings, of which one has not even seen an illustration, and then to be left in the dark, certainly is dull reading. Yet, after all, it must be remembered that the "Dictionary of Architecture" was not meant for the blind seeker after truth, but for the partially illuminated; and for such its pages often contain much curious and interesting information.

For some time back we have been interested in the career of a certain Pain, a pupil of John Nash, who, flourishing in the earlier part of the XIXth century, practised architecture in Cork, and was the author of a number of elegant white limestone buildings in that city and throughout the South of Ireland.

Inquiry has revealed that there were several generations of Pains all engaged, more or less, in the arts of building. George Richard Pain, the Cork architect, was one of several brothers. The eldest, James, was his partner in most of his important work, but practised chiefly in Limerick, where he lived to a great age, dying almost a centenarian, about thirty years ago. The other brothers all followed various branches of the building trades in London, their native place. Their father, James Pain, the "Dictionary of Architecture" tells us, was a "builder and surveyor," but says nothing more about him than that he assisted his father, William Pain, "architect and carpenter," in the compiling of some of the numerous books of which he was the author. For more of our information,

and for the loan of a number of original drawings, we are indebted to Mr. Benjamin Pain, who, when a young man, knew his uncle James at Limerick, and who, now an old man himself, follows the vocation of clerk of works with credit to himself, the last of his family in the building trades.

Our present concern is with William Pain's books, and with the architecture of his grandsons, James and George. Of the personal history of the former we know no more than that he lived during the latter half of the XVIIIth century, and that he came originally from Petersham, in Surrey. Apparently he was of a class that is nowadays extinct. He was not quite an architect in the modern sense of the term, but he had considerably more scholarship than the old-fashioned village carpenter. He styled himself variously: "joiner," "architect and joiner," "architect and carpenter," so that probably he was a carpenter by

Design for a Church. By George R. Pain.

Courthouse, Cork.
By James & George R. Pain.

training, who became a master of his trade, and whose taste for designing encouraged him to undertake the duties of an architect as well.

His books were written for men of the same stamp as himself. They contained no high-sounding disquisitions upon Palladio and "the ancients," like so many of the better-known works of the XVIIIth century; which is to say they were not "art" books; they did not pretend to treat of the fine art of architecture. Rather was their author content to treat of the practical details of building construction and design, of the cost of labour and materials, and especially of all matters relating to his own trade. His works seem to have enjoyed considerable popularity in their day, and for more than a generation after, for many of them were republished several times, and notably one entitled the "Practical House Carpenter," the last edition of which appeared as late as 1861. But gradually the class for which he wrote became extinct, his designs became old-fashioned, and his information obsolete, so that at the present day his books are curiosities, though not entirely useless.

Through the kindness of Mr. Herbert Batsford we have been enabled to look through a number of Pain's books. They all cover, more or less, the same ground. Estimating, directions for setting out work, rules for architectural proportions, the Orders, designs for buildings, and for all their details, down to mouldings, go to make up his usual stock-in-trade.

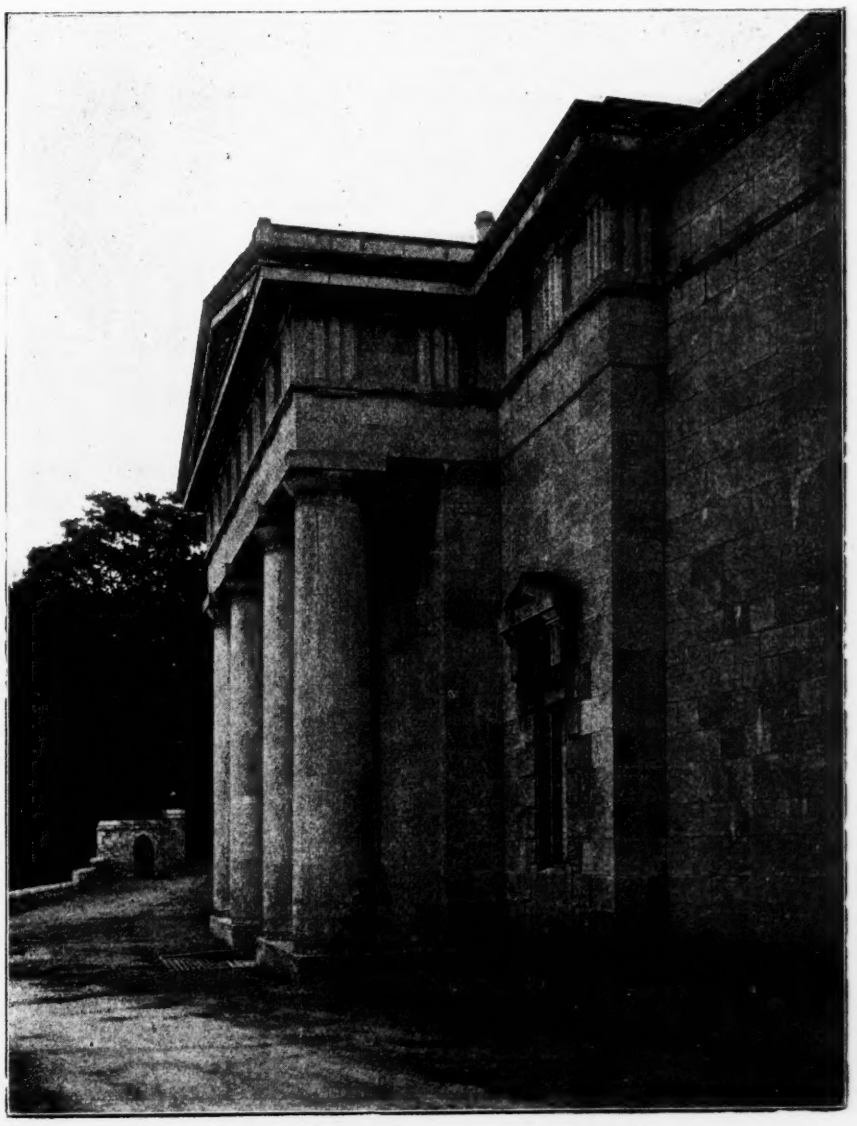
The most interesting exception occurs in the "Builder's Companion," in which the author, no doubt inspired by Strawberry Hill, at that time building, devised and set forth five Orders of Gothic architecture, with the columns diminishing, and all their members to correspond as closely as possible with those of the Classic Orders! The adaptation was, indeed, ingenious, yet it is a matter for sincere congratulation that the Gothic revival did not proceed far on such lines as these.

In some of the volumes many pages are covered with diagrams illustrating intricate joiner's problems, such as occur in hand-railing or in the development of curved surfaces, which feats of geometry Pain seemed particularly to enjoy; but many of the methods he employed have now for a long time been eclipsed by the advent of machinery.

In books whose avowed purpose is simply building construction, it is refreshing to find rules given for the architectural proportions of buildings in all their parts. The majority of them are very empirical, but, nevertheless, they were sufficient, even in unintelligent hands, to render impossible the feats of ugliness that are committed so often nowadays by speculative builders and ignorant architects. One rule, not an æsthetic one, for the lighting of rooms, differs from that usually followed nowadays in that it takes account of the cubic content of a room, instead of the area only. Pain's practice was to make his windows contain as many square feet as would equal the number obtained by extracting the square root of the cubic content of the room, also in feet. But the rule appears to err somewhat on the side of overlighting.

The designs for houses have no particular merit. The best of them occur in a volume published in 1786 which rejoices in the title "The British Palladio; or, the Builder's General Assistant." Most of the designs are of the perfectly plain and solid type of their period, while a few bear traces of the influence of the brothers Adam. All that can be said for the church designs, published in the "Builder's Golden Rule," is that they are no worse than the usual run of the period. On the other hand, in "The Practical House Carpenter" are a few pleasing designs for shop fronts, not unlike some of the old examples that still exist in Soho.

But the most successful part of Pain's work, and that which is of most value to the modern student, is to be found in the details that he gives of doorways, chimney-pieces, and the like. His designs, based upon the usual later Georgian type, are many of them distinguished in proportion and refined in detail, while errors of taste, though they occur, are not frequent. Mouldings are given in



Male Prison, Cork, 1818.
By James & George R. Pain.

great variety, drawn to a large scale, and these are especially worthy of study.

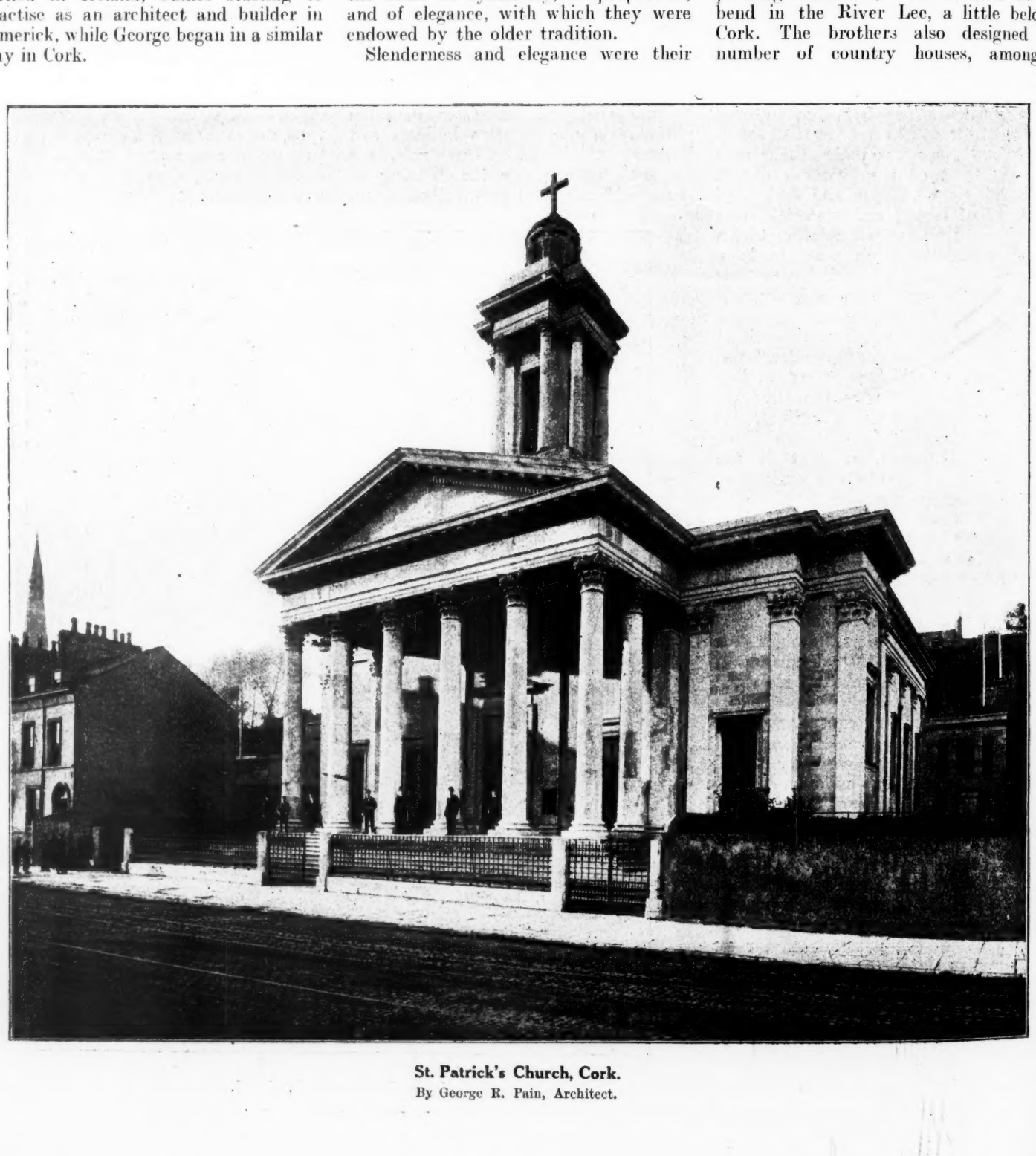
It is to be regretted that such men as William Pain, and the class he wrote for, should have ceased to exist. His books are evidence of the pride that the better-class workman used to take, not only in doing his work well, but also in doing work that would look well. Nowadays, when architects have multiplied and all matters of design depend upon their skill alone, the interest of builders and workmen is relegated, at the best, to mechanical excellence, and often degenerates into concern only for the profits that are to be made by their handiwork.

Of the two grandsons of William Pain, who became architects, James was born in 1779, and George Richard in 1793. They received their training in the office of John Nash, and were with him when he was designing Regent-street. Nash was also the architect of a number of Irish country houses, and about the year 1817 placed the Pain brothers in charge of the building of one at Loughcooter in Co. Galway. After this they settled in Ireland, James starting to practise as an architect and builder in Limerick, while George began in a similar way in Cork.

But though so far separated, nearly all their important work was their joint production. Tradition has it that of the two James was the better at planning, and was more the man of affairs, whereas George was the draughtsman, and designed the elevations. It is probable that Nash's influence secured for them the greater number of their earlier commissions. Owing to him, the "Dictionary of Architecture" says, James Pain was appointed to the Board of First Fruits for the province of Munster, which made him a kind of diocesan architect on a large scale, and brought him in a number of country churches and glebe houses to design. In this work he was largely assisted by his brother, and between them they contrived to handle the conventional "Strawberry Hill" Gothic of their day with considerable artistic success. The classic tradition was strong in their veins, and showed itself through all their work. In fact, their handling of the Gothic style was altogether uninspired by any mediæval feeling. But this want was more than compensated by the sense of symmetry, of proportion, and of elegance, with which they were endowed by the older tradition.

Slenderness and elegance were their watchwords, which they tried to attain by using long lancet lights and thin lines generally. Their tracery followed the perpendicular type, and was generally executed in timber painted white, while diamond panes were greatly favoured in glazing. Slender spires and small pinnacles also served to break up the skyline. Of carving they made little use; partly because of the hardness of Irish limestone, and partly because they can never have had much money to spend in decoration. There is always a charm about their Gothic rarely to be found in other similar work of the period; and though this is, in the main, the outcome of scholarly and artistic design, the fact that hard stone was its medium, instead of the much more commonly-used stucco, largely accounts for its honesty and definiteness.

The greater number of their essays in Gothic were naturally in the direction of church work, but they found expression in many other buildings as well. For the Corporation of Cork George R. Pain designed Blackrock Castle, a small and pleasing ornament, well situated at a bend in the River Lee, a little below Cork. The brothers also designed a number of country houses, amongst



St. Patrick's Church, Cork.
By George R. Pain, Architect.

which Mitchelstown Castle is their largest and best-known work. It is a fine pile, yet not altogether pleasing, being a little "lumpy" in composition, and marred in places by very inadequate mouldings. Though of local stone, it is unsympathetic in appearance, and not very domestic. Yet this, probably, is not entirely the fault of the architecture, but may also be attributed to the fact that the building, on three sides, rises sheer out of greensward, and is not permitted the grace of a single creeper to soften the contrast.

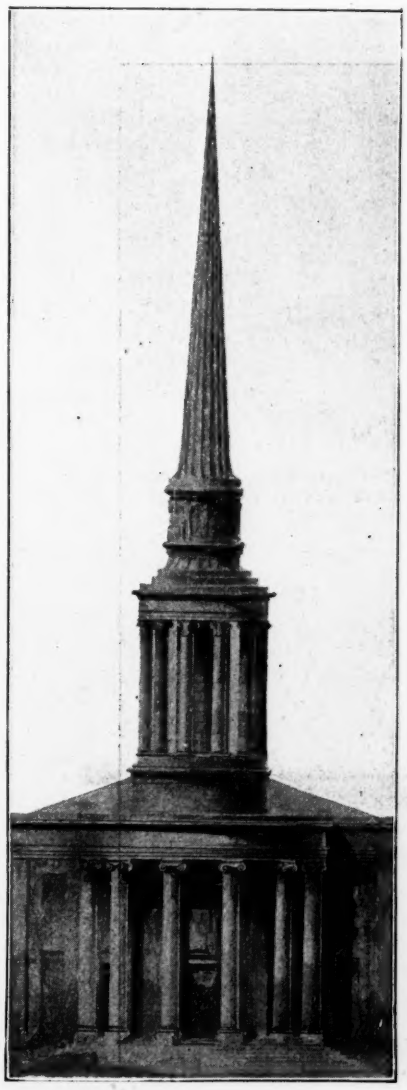
In their handling of classic architecture the Pains were on much surer ground; and they have left behind them several buildings which amply testify to their scholarship and ability in this direction. Of these perhaps three of their best are to be found in Cork:—The County Gaol, the Courthouse, and St. Patrick's Church.

The County Gaol, or, as it is now known, the Cork Male Prison, is undoubtedly their masterpiece. Directly approached by a road and a bridge, it has a heavy Greek Doric portico, flanked upon either side by long and entirely plain walls, crowned by a simple cornice. About a hundred yards behind, on the main axis line, and on much higher ground, rises an octagonal stone building, from which wings containing the prison cells radiate to the corners of the site. The whole composition is marked by an aloofness and a severity eminently suitable to a building of its kind. The perfectly plain wall at the bottom of the group effectively cuts off the prison buildings from all their surroundings, while the massive portico lends great severity to the entrance. The effectiveness of the latter is largely due to the fact that the fluting of the columns is only worked for a few inches on the top and bottom stones, while the drums are left plain, as in the unfinished Greek temple at Segesta, in Sicily. The only gratuitous decoration on the whole building is to be found in two niches, one upon either side of the portico; and even these, borrowed obviously from a design of Piranesi's, are very forbidding in their appearance.

In the Courthouse the chief feature is a spacious octostyle portico in the Corinthian Order, projecting well in front of the line of the building. On either side it is flanked by plain walls, with Corinthian pilasters at the quoins. At the apex of the pediment is a somewhat feeble group of sculpture, consisting of three figures, with Justice in the centre. The rest of the building has undergone considerable alteration consequent upon a fire that took place twenty years ago.

St. Patrick's Church has another successful Corinthian portico, but with six columns instead of eight. Behind the pediment rises a tall lantern, composed of eight columns, again in the Corinthian Order, projecting from a square belfry and surmounted by an entablature, on which stands a circular pedestal bearing a cross and with attached figures in high relief. Up to the top of the cornice this lantern is extremely elegant, but above the effect is a little marred by the sculptured pedestal, which is poorly treated, and does not logically fit its position. This church, by the way, was designed by George Richard Pain alone, and without collaboration with his brother.

A number of original drawings and sketches of the Pains are preserved, which are mostly the work of the younger brother. Many consist of small scale sketch designs for Gothic churches, drawn in a very pretty style; but there are also drawings of classic churches, and some designs for bridges across the Shannon at Limerick, two of which were actually carried out. G. R. Pain possessed considerable contemporary reputation as a Gothic designer, which originated from the fact that in the year 1812 he won a gold medal at the Society of Arts for a design for a Gothic church, and a silver medal the next year for a design for a Gothic palace. The former certainly was surprisingly good for its period, though nowadays it seems dreadful "gingerbread," and is altogether inferior to his classic work. Among the classic churches Nash's influence is clearly discernible, and particularly so in a design showing a circular Ionic portico with a Corinthian Order built round a drum, rising over the centre and surmounted by a slender fluted spire, the whole idea being similar to, but a distinct improvement upon, that of All Saints, Regent-street. Another idea, which emanated from St. George's Chapel, Regent-street, that of backing up a pediment with towers at the corners, occurs frequently. But the origin of this treatment, of course, comes from the Pantheon at Rome, and it was probably due to Piranesi's drawings that the idea became a somewhat popular one in early XIXth-century work.



Design for a Church.
George R. Pain, Architect.

We understand that James Pain gathered together during his long lifetime a large collection of drawings and books which was dissipated, no one can tell where, when his death occurred, in 1879. Among them was a set of drawings of the design submitted by his brother and himself in the competition for the Houses of Parliament, which, we believe, with Pugin's and Barry's, was one of the only Gothic projects sent in. Had this competition been won, how much better would their names have been remembered in the city of their birth!

ST. PAUL'S BRIDGE AND THE INSTITUTE OF ARCHITECTS.

THE Chairman of the Select Committee of the House of Commons which examined the Bill for St. Paul's Bridge is reported to have said that the Royal Institute of British Architects was invited to appear before the Committee, but declined on the score of expense—the expense being four guineas. This statement was used by several speakers to discount and discredit the opposition of the Institute, and it was repeated and commented upon in the Press in a way that, in our opinion, was damaging to its reputation. We have the best authority for saying that this statement is inaccurate and that the Institute was not invited to appear. We understand that the Institute was advised—rightly or wrongly is not the point—that the cost of appearing before the Committee uninvited was an unknown quantity, depending on the length of the inquiry; that in any event the cost would be heavy, and might possibly amount to as much as 1,000*l.*, or even more. Under these circumstances the Institute decided not to appear. Had it been invited to appear, as was stated in the House, the cost, we are told, would be nominal. The point is, it was not invited. It seems well-nigh incredible to us that such a misunderstanding should arise, or that responsible people could be found seriously to believe that a representative professional society which had already given every proof of its *bona fides*, and had done its utmost by letters, by deputations, and petitions, to Parliament, should be deterred from appearing before the Committee by a disinclination to pay four guineas. Nevertheless, we have not the slightest doubt that the statement was made in Parliament and commented on in the Press in absolute good faith. We think the Institute owes it to itself and to the profession to place the facts on record, when we have no doubt it will obtain the reparation due to the representative society of a profession which is at least as public-spirited as any other. The Institute may or may not have been well advised in deciding not to appear before the Committee uninvited. It has many other responsibilities to consider, and it is the best judge of its own resources. No one will doubt that its decision was prompted by the same sense of duty that had prompted its previous unavailing protests; but we are of

opinion that it has now no option but to come forward, whether invited or not, and place its advice at the service of the community, as distinct from the Corporation, when the Bill again appears before the Select Committee.

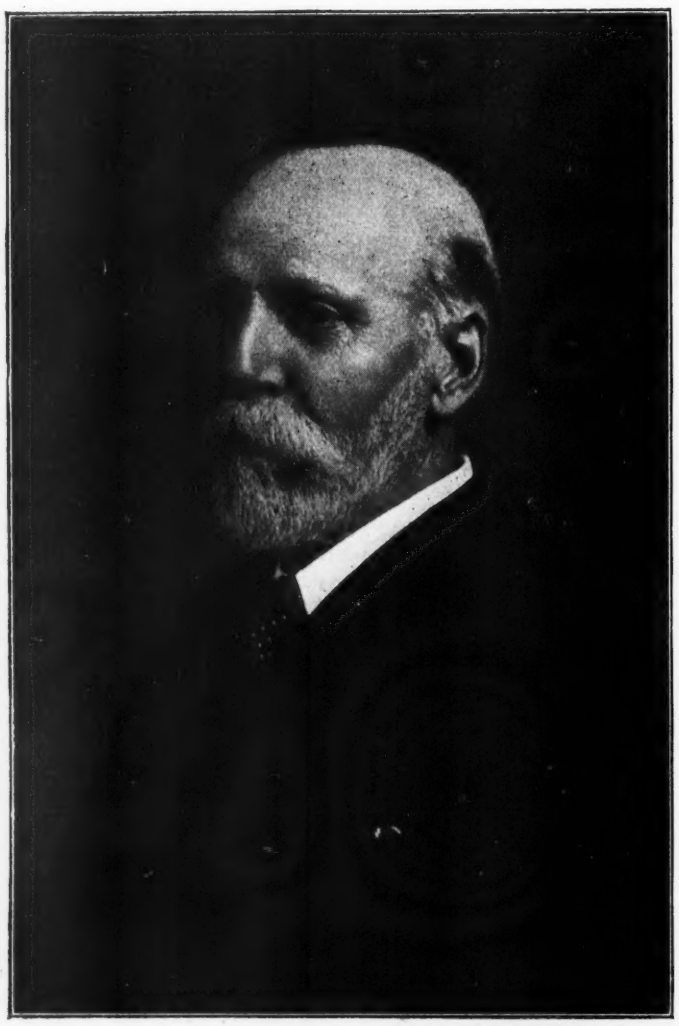
NOTES.

Sir Ernest George, A.R.A.

IT is refreshing to see from the list of Coronation Honours that the art of architecture has received some recognition, and that a deservedly popular architect, who is at the same time an artist of distinction, has received the honour of Knighthood. Sir Ernest George is so well known to members of the profession that it is unnecessary to mention his many claims to such a distinction; the fact that he has occupied the position of President of the Royal Institute of British Architects and has received the Royal Gold Medal for his works as an architect affords some evidence of the regard and esteem in which he is held by his brother architects, and for these and other reasons no more fitting recipient for the honour of Knighthood could have been found.

St. Paul's Bridge.

THE full meaning and ultimate effect of the vote of the House of Commons with reference to St. Paul's Bridge will only become apparent and be fully realised as time unfolds them. Its immediate effect, as the *Daily Chronicle* points out, is to assert a great principle—"that any large scheme for an 'improvement' in London is not a matter only for engineers, traffic experts, and police authorities, but a matter also for artists, architects, and town planners." This principle once asserted becomes an obvious truism. It establishes a precedent difficult to overthrow. But its effect will not stop here. Its moral influence on other cities and on the whole country will be far-reaching and beneficent. As to its real meaning—who shall say? That this is no chance division under the influence of a temporary outburst of sentiment is evident from the weight of public opinion behind it, as voiced by the daily Press. Never, we venture to say, has the House of Commons more faithfully reflected the better mind of the nation. This is significant. To us the event is historic, and marks an epoch in our national development. If anyone should be tempted to see in this divine discontent a reawakening of the spirit of beauty—too long dormant in the soul of the nation, smothered and suffocated by two generations of sordid materialism—who shall gainsay him? And if the enthusiast should even go so far as to tell us that he sees at last the first glimmering of the dawn of a brighter day—a veritable renaissance—the birth of one of those golden periods in art when the genius of the artist is inspired, uplifted, and sustained by a genuine passion for beauty in the heart of the people! Hope springs eternal—who knows? There is something stirring.



Sir Ernest George, A.R.A.

(Photo. by Elliot & Fry.)

The Corporation and the Bridge.

THE present attitude of the City Corporation reminds us too forcibly of the man who, convinced against his will, remained of the same opinion still for us to feel much confidence in their future course of action. Judging from recent reports, they still believe in their scheme, and still mean to push it through. They appear to take the position that the reference left them perfectly free; that they have agreed to nothing; and that if an attempt is made to do anything they do not like they can withdraw. It is, of course, better to have no bridge at all than a bad one, but we do not think it will come to this. Their attitude, however, seems to justify the note of warning already sounded in the Press, which we hope will not relax its vigilance. It is stated in one quarter that two eminent architects will be consulted on the scheme "as it stands in the Bill." Should their verdict be favourable the Bill will be again put forward, "fortified by their approval." It is, of course, open to the Corporation to maintain that the reference meant nothing in particular, but it is also open to the opponents of the Bill to hold that Parliament has already passed its verdict on the scheme "as it stands in the Bill." We think that even in the improbable event of the Corporation obtaining the approval of two eminent architects, their approval is not likely to be endorsed by Parliament unless it is backed by the approval of the whole profession and of educated public opinion. This approval is not likely to be granted to any small modification in detail of the scheme as it stands in the Bill. For we think that Parliament realises, as all architects must realise, that the scheme is wrong in its general conception. If there is any doubt in the public mind on this point it is for architects still to continue their educative campaign.

"Eminent Architects" and the Bridge.

WE must say that the proposal to consult one, or even two, eminent architects in this way does not appear to meet the situation. It sounds so eminently reasonable and satisfactory, and yet it may mean so little. If they are to be consulted as independent experts as to the best way to deal with the whole situation, that is one thing; but if they are to be retained and asked to bolster up the scheme as it stands in the Bill, may not this be a waste of labour? There seems also a danger that in selecting such men the Corporation's idea of eminence may not be that of the profession, and that they may select someone more eminent for the quantity than the quality of his work. The men best qualified by natural ability and special training to deal with such unusual and important artistic issues are not necessarily to be found in the ranks of the eminent practitioners. We see Professor Pite remarks that "if the Corporation require an honorary committee of architects to advise them the President of the Royal Institute of British Architects would form one immediately." We think they might do worse than take the hint. After all, the great point is to see that the best

brains in the profession are brought to bear on this question quite regardless of "eminence" or of any other consideration whatever but fitness for the work in hand—the tools to those who can handle them. A competition may be—we think it probably will be—the best way to discover the most fit, but this is just one of the points on which an honorary committee could advise the Corporation.

Vandalism at Seville.

THE Seville correspondent of the *Times* calls attention to the proposed demolition of the ancient Roman aqueduct which for more than 2,000 years has supplied, and still supplies, water to half the population of Seville, and to substitute for it a cast-iron pipe. The reasons put forward for this apparent act of vandalism are that the water is made dirty by fissures in the structure, and that the structure itself retards the development of the suburb through which it passes. The *Times* correspondent points out, however, that the water as a matter of fact is excellent, that the fissures in the structure could be repaired, that the so-called suburb is practically non-existent, and could freely develop under present conditions, and allows us to infer that the real reason is private gain by persons interested. The protests of the Academies of History and of Art have caused the Minister of Public Instruction and of Fine Arts to intervene with a certain amount of effect, but, we are told, a determined effort will be made to carry out the destruction. There may be occasions when even the most venerable and interesting monuments of the past must disappear before the march of human progress, but this does not seem to be one of them. The destruction of such a valuable relic would not only be a loss to Seville and to Spain, but to every lover of antiquity in two continents. We hope the efforts of the Academies of History and of Art will be successful, and that, if necessary, their protests will be supported by similar societies in other countries.

"SI MONUMENTUM REQUIRIS:—?"

THE following paper, by Mr. Halsey Ricardo, was read before the Birmingham Architectural Association on January 20 last:—

"In the Book of the Past—so much of it as has reached us in the present day—amidst the ruins of Art and Literature, the most eloquent and most instructive to us architects, perhaps, are the evidences of man's outlook upon the world of his day, as embodied in the relics of his handiwork in the forms of architectural monuments and buildings. They throw a broad light upon and help to explain his poetry, and in their less-impassioned way sum up, in their grave and pictured repose, the ideals of their race of builders. We look upon the ruins of antiquity and we see now the main issues only; the smaller characteristics have undergone changes and modifications or else have disappeared. The true speech of the building has survived, and still voices the cry of the nation—now passed away—that reared it.

King's Architecture.

Where are now the Assyrian peoples and the mighty host of Babylon? But we can read in the shapeless mounds of Mesopotamia and the sculptured slabs from Nineveh what kind of folk they were. Their architecture was King's architecture; the palace crowning the terraced city was the supreme feature in the plain; royal wars and royal sport were the ideals of their aristocracy; the fear of death and the finality of the grave gave to their soothsayers and astrologers a place almost equal to their princes. Life was one of restless energy, of incessant trials of strength, of fierce pride and savage butchery. But they knew how to appreciate the kindly fruits of the earth; by able regulation of their two superb rivers to irrigate the plain between, they made what is now, since the ruin of their watercourses, a desert a fertile land teeming with horses and cattle, heavy with harvest, and rich with orchards and garden produce. Their portrayal of the animal life about them shows a friendly intimacy and keen appreciation of their qualities; labour was the lot of all but a high-bred few, but the earth was bountiful—enjoy the good things whilst you may, till death comes and closes all in the silence of the tomb. The Egyptian's conception of the mystery of life was a different one, and his architecture is different in consequence. He, too, dwelt in a plain watered by a noble river, and irrigated by his skill to a surprising pitch of fertility. For him, too, life was one of labour, whilst his King and the great ones of the Court brought trouble and disaster to his home by their quarrels and their warfare. But the radical difference between him and his neighbour by the Euphrates was contained in his creed. For him the grave was but a portal-opening to usher him into a further life, and on the threshold there was judgment; and his whole future depended on the verdict.

Priests' Architecture.

So the architecture of Egypt is Priests' architecture; for the priest, as guardian and director of the soul on earth and interpreter of the mysteries and requirements of the life to come, was paramount. Consequently the ruins that we see in the valley of the Nile are ruins of temples. If we turn our eyes to Greece we find the sculptured temple as the distinctive and crowning glory of the Ionian peoples. Hammered into one large, compact confederacy by the actual blows of the Persian invasion and the threats of reprisals to come, Greece, headed by the Athenians and supported by its kindred in the many islands and on the mainland of Asia Minor, dared the Eastern world to do its worst, relying on its inspiration of the gospel of democracy and in the strength of its own unconquerable courage. The just man is he who shall prevail, and the fine spirit in the healthy body becomes the ideal. The temple is dedicated to the man as well as to the deities; besides the Parthenon on the Acropolis, there is the Theseum in the city. The beauty of the body is seized upon by the sculptors and painters, and, indeed, one might classify Greek architecture as "sculptors' architecture." The temples are so many receptacles for the carved images; their walls, their columns, their entablature and cornices are so many opportunities and so much material for sculpture; sculpture is forced into the pediments, and statues stand on the apex and at the verges. It is the apotheosis of victorious manhood—victorious because it sought for a high ideal and battled for it, enthusiasts, like men—for whom strength of limb and endurance, as well as strength of mind, was a moral obligation.

Engineers' Architecture.

The Roman people were of another kind altogether. They, too, had been welded into a defiant soldier mass by invasion from the Etruscan, the Goth, and the Carthagenian; and they emerged from this hammering with a fierce craving to conquer all the world, and thus ensure—as its master—peace and the opulent blessings in its train. And under the Emperors they seemed in a fair way to attain this grandiose ideal. Nearly all the known world was theirs; it was only on the remote fringe of their enormous empire that any tribes dared to dispute their sovereignty. The conquered nations that owned the sway of Rome enjoyed her privileges, her justice, her liberty, and her laws, and called themselves Romans with proud eagerness. Rome itself was the repository of the spoil from the provinces, the centre to which the curious and the wealthy converged, the home of the idle as well as the seat of government, crowded with pleasure-seekers and a spoilt populace that had to be entertained to keep them quiet. No wonder that one sees in the ruins of her public buildings evidences of megalomania, of an attempt by sheer size and costliness to impress the beholder and lead him a submissive captive! The soil was favourable for such an undertaking. Rome stood on seven hills, but also on a bed of natural, superlative cement, to be had for the digging. The Roman soldier was a builder of necessity. Fighting could only be done in the summer half of the year; the remainder of the days were spent in winter quarters. So the camp had to be built and fortified, roads and bridges from it to the near provincial headquarters made, temples, a forum, basilica, and market-place built and laid out, and shelter provided against heat and cold; and all this work was done by the soldiery and such natives and prisoners as they could coerce for labourers. After his days of campaigning were over the Roman soldier was well qualified to superintend what public and private works might be going on in the neighbourhood of his residence, and there were slaves enough in Rome and in Italy to perform the great mass of unskilled labour that concrete erections require. Moreover, the Roman was a born organiser, and the superintendence of gigantic works of construction called out his special powers that had been kept well practised from his youth upwards. Roman architecture may be described as "engineers' architecture." It concerns itself with structure and planning on the grand scale, with the problems of hygiene, the supply of water, the embankment and bridging of rivers, dock-walls, quays, and military defences, arsenals, and supplies for the fleet. These they built straightforwardly, planning and shaping them to meet in direct fashion the requirements dictated to them. When one comes, however, to examine the buildings for display—such as the palaces, theatres, amphitheatres, public baths, basilicas, and so forth—one sees for the first time building the enrichment of which is not integral, but appliqué, and for the most part provided and applied by the foreigner. The Roman recognised that he was not a decorative artist—doubted whether he was an artist at all—and rather despised such tedious trifling as the architectural upholstery of his buildings appeared to him. He was content to plan and rear the bones of his great conceptions and let the handy Greek workman (*Græculus esuriens*) that infested his city clothe his structure with the needful haberdashery, he only stipulating that there should be lots of it and that it should show that it has cost an immense sum. Consequently, you find his buildings ringed round externally with columns out of work, idle pilasters, superfluous lintels—the stock-in-trade of the Greek artist, to whom these things were integral in his tradition of building. Moreover, ships were pouring on to the quay walls an incessant stream of columns, carved reliefs, strange marbles, bronze plates, statuary in marble, stone, and bronze—the loot from some vanquished city in the East, or the plunder from the Greek colonies, or even from Greece itself. All this material, belonging to quite another conception of building, had to be employed and housed somehow, and so, after as many had been set up externally as places could be made for them, the interiors of the buildings were plated with marbles, encrusted with mosaics, and made resplendent with Corinthian brass and gilding. The Greek seems to have been since his dispersion from Attica absolutely without conscience; he was as happy with a counterfeit as with a reality, and got a grin of satisfaction when trading off a substitute or deceiving a connoisseur; he was ready to pander to the vulgar cry for profuse, indiscriminate ornamentation—it put money and extra wages into his pocket—and he was diabolically skilful in his craft. But he must have despised the ignorant ostentation of the Roman with his Philistine admiration for size and cost, and his brutal disregard for the artistic restraint that was traditional in the Greek race. The planning of the great public buildings—the forums, basilicas, the baths, and vast amphitheatres—is extraordinarily fine and able, and their construction reveals an amazing amount of forethought and contrivance. The general effect of the buildings must have been grandiose

indeed, and extremely impressive from their mere bulk and capacity; but no artist, I suspect, could have pronounced them beautiful. We have a good deal of the Colosseum still standing, ex pede Herulem; colossal it certainly is, and one gazes at it reverently on account of the wonderful history held within its walls—history of human bravery and despair, of immeasurable suffering, and enthusiasm triumphing over physical pain. But no one could call this huge game-pie beautiful. The arches of Titus and Septimius Severus—yes; but here the Roman constructive genius has no place, no occasion to distinguish itself. They might have been—they probably were—built wholly by Greek workmen; they are examples of "sculptors' architecture." The Pantheon is a wonderful conception, perfectly magical in its general effect, speaking of the inside, an effect entirely independent of its particular internal decoration. Doubtless in the heyday of its prosperity it looked far more sumptuous with its wealth of coloured marbles and gilded bronze and stucco, but I can suppose that it reached that acme of profuse ornamentation towards which our premier hotels are now striving. There is, in fact, a noticeable deal of correspondence between our situation of to-day and that of the Roman in, say, the time of Trajan, and in more respects than in the matter of building activity; but I will concern myself mainly with this latter aspect. We have, like him, an incomparable cement—if not for the digging, at least for the making—and in incalculable quantity. We have, it is true, no slave labour, but we have its equivalent, and more than its equivalent, in our use of machinery. We excavate and pump, quarry our stone and granite, cut and fire our bricks, pound and grind our aggregate for our concrete and mortar, mix our materials, hoist them on to our scaffolding, saw our timber, trim our joinery, roll and cut our metals, draw our pipes, and manage our castings all by machinery. And this machinery represents so much men's power acting unanimously. The tall boom of the building crane, with its prehensile finger-like hooks, travelling to and fro about the building, with a single hand to control and feed the engine, might be translated into a battalion of workmen digging, swarming ladders, fetching and carrying under the instructions and supervision of a band of taskmasters. So far as appliances go we are better off than the builders of Caracalla's Baths. One of the troubles that always pressed on the Roman builder was the difficulty of obtaining scaffolding and adequate centring for his arches. With him it was one prolonged agony of contrivance to make his insufficient carpentry attempt the task required of it.

Roman Construction.

His concrete construction, especially the vaulting, is eloquent testimony to his poverty of this material and his ingenuity of resource. Something of this quick-witted quality he must have learnt as a soldier—when the camp had to be hastily fortified or a pontoon thrown across the river for the army in retreat—and doubtless his wits were sharpened on the scaffold by the lash of the superintendent. But to make anything do for a centring and to be as far as possible independent of the carpenter's shop was the prime virtue of the Roman artisan, and it is his ingenuity in this respect that gives us the key to the brick ribs and tile plating that we find in his concrete vaults. Timber was a valuable commodity in Central and Southern Italy. It was wanted in great quantity for domestic purposes, for warming the houses and public baths, for manufactures, for house building and farm sheds, and so on, and squared timber was bound to be costly. To-day, with our circular saw driven by steam or electricity, we can slice up a tree-stem with almost the same ease that we can slice a carrot, and we can have our timbers cut to any scantling we may choose to specify. But it was another matter when you had to fell a tree and square it with a bronze saw and bronze axe, and the converting the baulk into planks must have been a laborious business. Any request for planking and spars for temporary purposes met with a cold reception at the carpenter's shop. What would they have thought of the forest of tree-trunks that supported the stupendous centring on which were moulded the concrete vaults of the Roman Catholic Cathedral at Westminster? They would have crucified the clerk of works out of hand as the first preliminary to sweeping such a monstrous extravagance clear. We live in other times, but we have not such very dissimilar work to do. We, too, are raising public buildings which we hope shall be the monuments of our time and the architectural expressions of our ideals of life. And, in fact, so long as they stand they will be the witnesses for and against us for the good that there was in us and for our shortcomings. To name them is sufficient to show the general trend of our ideals. Town halls, picture galleries, museums, libraries, board schools, hospitals, asylums—they all show what is our conception of what man and his life should be in relation to this large world on which we stand. Churches are the expression of man's aspirations beyond this world, so far as they differ from the other public buildings mentioned. But the testimony they all unite in giving is this: that we have a view of corporate life larger and more active than any held one hundred years ago, and that we are determined that no one shall start his life hopelessly ill-equipped in the matter of education or hopelessly starved in the matter of literature and the fine arts. That no man shall be sick so long as medical science can serve and alleviate, miserable beyond comfort, distraught untended. So far as in us lies, no man shall wrong another by carelessness, as well as by crime. Our sewers and drains are engineered in a way that would win the approval of a Roman ædile, and our fire-stations and brigade his enthusiastic admiration. I think these materialised expressions of our sentiments will stand to us for long for righteousness, and with the dignity, if not beauty, that such sentiments suffuse over their realisations, in contrast to the sullen jails and workhouses of our forefathers, who knew no better what to do with the unfortunate than to treat them as criminals.

Middle-Class Life Nineteen Centuries Ago.

But for the fortunate (for us) overwhelming of Pompeii with dust and cinders we should have scarcely any idea of the middle-class dwellings of classic times. We have descriptions of the villas of the wealthy patricians and the *nouveaux riches*, but of the citizen's house we have scarce mention or trace elsewhere. All the busy life at Athens, Antioch, Alexandria, and Rome has fretted its course without leaving any visible sign in bricks and mortar of its existence. A few scattered foundation-piers without the walls testify to their once supporting domestic walls and enclosing the hearth and home of the official or the farmer. But of the millions who crowded the cities I have named or dwelt in the suburbs round about them, or of those who toiled to provide their necessary sustenance or their arbitrary pleasure, not a vestige now remains. Their dwellings were as ephemeral as the dwellings for the same class are to-day. But by an unique catastrophe we are able to look in upon middle-class life as it amused itself in the days of Pliny, who describes the suffocation of Pompeii. It was but a very second-class watering-place, and as its destruction involved scarce any loss of life its ruin raised far less emotion than that of its neighbour, Herculaneum. Its reputation, such as it was, had suffered seriously some three years before its extinction owing to an earthquake that had done widespread damage. Most of its "smart set" had been frightened away and the jerry-builder had been called in to reinstate the shattered buildings, and the evidence of his shoddy repairs occurs everywhere. But all this notwithstanding, we get a startlingly vivid impression of the daily life at Pompeii as we pace the streets and peep through the opened doorways, and the strange thing is that this life, that passed away near nineteen centuries ago, seems the life of almost yesterday, familiar and touching us nearly—one feels akin; and all the evidences of their habits and their requirements strike one pathetically because they are so like our own. You almost expect to hear the postman's knock, and scarcely notice the absence of gas-lamps. We can gather from this gaze upon a city in a trance what the general run of domestic buildings were within the walls of a town. And then the curtain shuts down again, and we see no more until the revival of letters and the general establishment of personal security permits our middle-class burghers to build houses for themselves which shall be, besides their shelter, a pride and an ornament to their own calling, and in which their posterity shall dwell, to the glory and honour of their name. Consequently the element of permanence becomes a factor in the erection of these buildings; a house that was to be in the family for generations and generations must be built to last, and, whilst not so substantial as a fortress, must give its inhabitant a sense of security not only against time, but also against the unfriendly hand of man. This standard of construction is what we architects have founded ourselves upon, and which we postulate when we set ourselves to design either a town or country house. But it is not what the generality of our clients require—this quality of permanence does not appeal to them; they are afraid of the responsibility of such heavy outlay; they are seeking for the minimum of expense consistent with protection from the elements. And it is the architect's function at this present day to meet his clients' requirements straightforwardly, recognising the new conditions under which the most of his work has to be designed and carried out. When a man builds a house for himself nowadays he is generally getting on in life and has no expectation of his son being able or wanting to inhabit the house after his decease. He is afraid to put too much of his own individuality into the building, lest it should prejudice its sale after his death. He sets no great store on the substantiality of its construction, well knowing that his successor, notwithstanding his efforts to build to please the average taste, will want at the very outset to knock the building about and make alterations to it, and the purchaser, from his own experience or from expert advice, will consider unfavourably the solidity of the walls he proposes to remove—provided they keep out the damp he doesn't mind how thin they are—and he parries the accusation that they let in the cold by an installation of hot-water pipes and radiators. These prudent considerations prevent him from taking the pride in the house that he is rearing that actuated the squire or prosperous merchant of a century or so ago, or permitting himself to grow much attached to the building that he has raised. A new house is a raw, inhuman thing; it requires more than one generation of occupants to invest it with the humanity it so dreadfully lacks. By and by when the walls begin to tell of the pulse of life that has vibrated behind them, when they become infused with the story of human passion, its hopes and fears, its sorrows and joys, the coming of the younger folk, the death and dispersion of the elder, the house takes on the vesture of humanity and is clothed with associations. The hand of man is discernible all over it—the warm touch of his care, his affectionate lingering about it, humouring it with thoughtful attention, helping it to accept the beneficent and sheltering it from the destructive hand of Time. Thus the house becomes beautiful, and the painter calls it picturesque. This is the reason, I hold, that so many scour the country to discover old houses and cottages and ensconce themselves therein, crying out to architects, "Why can't you build like this?" We can reproduce these buildings, as far as their construction is concerned, to-morrow, if that is what is asked for; but it isn't. And we have no means of investing them at the striking of the scaffolding with the qualities that a century of human tendance only can bestow. Nor would we if we could. Such qualities must be honestly come by; any attempts to imitate age, besides being dishonest, are in the end disastrous expedients, recoiling inevitably on the producer. The domestic building of to-day must represent the domestic life of to-day, just as the house of a hundred years ago reflects the life of our forefathers. Ours of to-day is different, almost radically so; we are the creatures of our time, and can only play at being early Georgian, and life for most of us is too serious for such play.

Modern Inventions.

Since then the steam-engine and all that it entails, the electric telegraph and telephone, and the motor-car have entered into our life, upsetting the centre of gravity of our position. At all points our life is more dependent upon our neighbours than it used to be—we are less self-supporting and less self-sufficient. We have changed the standard of locomotion both on the roads and in our streets, and immensely increased its speed. We are in instant contact with each other when we choose, though corporeally miles apart. We have raised the standard of comfort and complicated the apparatus of living. It was a simple matter to tend a wood or coal fire, or to empty the slops out of the window; now it requires a heating engineer to attend upon our systems of warming and ventilation, and a sanitary engineer to look after our drains and the septic tank. Whether we live in the country or in the town, we depend upon our tradesmen calling daily or oftener. The old uses of the scullery and the larder have almost vanished, or, rather, the necessary preparations that had to be done or stored there are now done by the fishmonger, the poulterer, and the greengrocer, and we want space only for the requirements of the hour. The stately regiment of cupboard doors and shelves, the clothes and linen presses, the storerooms, the dairy, and the wash-house are fast drifting into that limbo where the dead moons are, whilst, on the other hand, our sanitary conveniences are developed and multiplied in a way that would astonish our grandparents. Except in houses of admitted splendour, a bathroom was not provided, and often the hot-water service did not rise above the kitchen level. Some of us can still remember the dear delight of the weekly tub before the nursery fire, with the great cans of hot and cold water standing on guard and ready to do their service. Now we stipulate for bathrooms, if not to every bedroom, at least on every floor—on the ground floor for the tennis players, in the attics for the servants; and, to add to the strain on the boiler, the paroxysms of bathing take the whole family and the stranger that is within their gates simultaneously. Even the necessary water for this thirsty cleanliness is not always easy to provide, and engines are requisitioned to do the pumping. In the train of the engine comes the electric light and general debauch of illumination. No one seems to have the heart to damp down the cutting brilliancy of the metal filament, and our rooms as a rule are grossly overlit. The result is that one's eyes get stimulated up to this standard of illumination, and, like the dram-drinkers, cry out ever for more and more light. A pair of candles sufficed one's grandfather to read by; now we consider that a 16-candle-power bulb hardly supplies us with the requisite amount of glare. This heightening of the brilliancy of our illuminants pervades everything. One should not complain of it in our streets, nor perhaps in the shops, but the excessive profusion of it in our public rooms, theatres, and tube railways is harmful. The ease with which it is supplied and the kind of vulgar opulence that it sheds lead its purveyors to supply a reckless and preposterous amount, ruining eventually the purpose for which it exists. In a restaurant worthy of the reputation it considers itself to possess one has to eat one's meal in all the discomfort that one would find in the Great Sahara with the Libyan sun beating down overhead and never a twig or leaf to mitigate its searching intensity. In the theatres it lends itself to so many tricks and effects of lighting that the eye is wearied with its restless, overpowering brilliancy, and cries out vainly for some quiet piece of shade, or even half-light, on which to rest. It is for ever having to focus itself on some fresh object, and in order not to miss some poignant small detail it has to take in in its grasp the whole scenario. Flogged up to this heightened activity, it loses its power of moderate appreciation, and declines to discriminate unless the contrasts are violent; we see things in a series of lightning flashes, and our orchestras produce the consequent thunder. I hope that we are nearing to a revolt against this tyranny of the electric light and this extravagance of theatrical mounting, and it is for us architects to lead the way to this reform. We are—with all modesty let it be said—the advance guard in the matter of the art of living; a few desperate squadrons of faddists, no doubt, are skirmishing on in front or beyond our ranks—extremists who take up some particular fibre out of the bundle that constitutes the science of living and run it to its logical conclusion, little recognising that a logical conclusion is an absurdity. But the architect—it is his *raison d'être*—devotes all his knowledge, his experience, and his thoughts to the art and the science of living, treated in detail and summed up as a whole.

Requirements of the Day.

His concern, besides the right shape of the house, is the right use of the house, not by any means a simple or recognised matter. The traditions of house maintenance and the acquisition of household goods have undergone great changes of late years. There is now the same little regard for permanence in the furniture as there is in the house itself, and there is a new sense of unrestrained comfort that is antagonistic to the severe ideals of the XVIIIth century. One of the satisfactions of the craftsman as he designed and worked at the furniture of that time was the knowledge that it was going to be well looked after and well cared for. Elbow-grease was the marrow of its life, and as long as the supply of that article was unfailing so would his handiwork respond to the attention and gain by the application. But elbow-grease to-day is a rarer commodity, and we are offered on all sides substitutes for this irreplaceable complement to the joiner's production. Nay; substitutes are thrust upon us whether we will or no, incapable of elbow-grease and even ruined by any attempt at application. Our brasswork is delivered to us ready lacquered, for instance, with severe injunctions that it is not to be touched by anything harsher than a silk handkerchief or a feather duster. We may view the passing away of the polished mahogany dinner-table, mirroring on its faultless surface the crystal and silver array that stood upon it, with a sigh of regret, without wishing to recall the tedious labour that produced that polish and the incessant precautions necessary to preserve it; but it is certain that till we have learnt to value our possessions and treat them with respectful care we cannot expect that they will be made with the thoroughness and nicety that those qualities demand for their justification. And yet we do hanker after those human touches, and either collect old furniture or purchase their imitations, neither of which courses are the least helpful to the handicraft that we profess to admire and encourage. Consider the position of the cabinet-maker—it is not so much unlike the position of the modern designer of domestic architecture. He is called upon to imitate work of some past date the main characteristics of which were its admirable workmanship and its perfect fitness for the services which it would have to render. Behind it lay an unbroken tradition of craftsmanship, the embodiment of acute discernment and stored experience. The result was an equilibrium of the various conditions given put together by hand and mind, and its beauty is due to its complete response to conditions that were human and honest, dictated by the deserved pride of manufacturer and purchaser. These conditions in their essence we must reproduce to-day if we are to have anything to show worthy of our age, and we have got to show that such conditions are in themselves healthy and fruitful, whilst the construction of imitations is unwholesome and fruitless. We must recognise that the requirements of to-day have changed during the last century, and that the processes of manufacture have undergone a violent transformation. Extraordinarily capable machines, with virtually superhuman dexterity, are ready to prepare and almost complete the stuff on the craftsman's bench. It would be folly not to take advantage of such powers, but it is no less folly to abuse them, as we do. So far as they can serve us in the unobtruded needs of life we should make all the use of them that we may require; it is when they offer to produce for us those touches of handiwork, those visible indications of the heart and hand of man, that they overstep their proper boundary and bring themselves into disrepute. Take the flooring of a room for example. Clearly it is a sensible thing to have the battens sawn, ploughed, and tongued by machinery, and so save the joiner a wearisome length of labour; but when it comes to having the panelling of the room executed by machinery in imitation of the panelling of the Tudor days it is an abuse of the machine, a misprision of its merits, and the result is an eyesore. The owner may be proud at first of the precision of the mouldings, of the rectitude of the panels, the accuracy of the dimensions—all of them virtues of the machine, but none of them special virtues of a wall decoration. In time the mechanical excellencies get upon his nerves, and for his own peace and comfort he does all he can to break up and interrupt these impertinent perfections by putting tall pieces of furniture against his inhuman geometry and hanging pictures to arrest the deadly continuity of its unfaltering lines. Machine panelling, if you want it, must stand on its own merits, and not be an imitation of hand panelling. Nobody objects to the truth and accuracy of the floorboards—one insists on these qualities. Walls can be lined or panelled in wood without any attempt at the wayward or ingenious contrivances of the joiner, or the employment of elaborate mouldings, which were a triumph to the craftsman with his moulding-plane or chisel and gouge in his hand, but which are so much mechanical ingenuity and steam-power wasted, and worse than wasted, when reeled off or bitten out by the machine. Nobody, I imagine, defends carving by machinery—the loss of human touch is so glaring; and what is carving worth without this quality infusing the execution as well as the design? But the shaping of mouldings is carving, too, and so far as they have any beauty (independent of their service of saving the sharp square arris from fracture or showing ugly bruises from careless accident), that beauty depends on the eye recognising good craftwork and the healthy pleasure a man gets from the dexterity of his own hand on the tool. It is the attempt to imitate and deceive that is so tiresome to the victim and so discouraging to the worker, and even to the machine itself, which has to be made most exceedingly complicated and delicate to carry out these unnecessary demands, and which in order to earn a dividend on its undesirable complexity and expense has to be made to work incessantly and cover everything over with its products to justify its existence. These elaborated products, superfluous in themselves, are made in many cases to serve as masks to conceal faulty or imperfect workmanship. Even when we get new methods of construction, the traditional appearance of the thing is too strong for us, and we try to conceal the construction by making it imitate the article for which it is a substitute. To take the Canadian solid-wood door for an example. It is a most reasonable and excellent way of making a veneered door and a door that will keep true and full measure, and, owing to the way it is built up, is an excellent valve against the transmission of sound. What could you have handsomer than your sheet of oak or of mahogany hanging in your door-case, with its broad unbroken surface to show off the figure of your wood or your ingenuity in marquetrie? And yet the aim of the manufacturer, as set forth by his catalogues, is to make this door pretend to be a panelled door, and to do violence to the merits of its mode of construction in order to make this pretence more plausible. So with the manufacturers of imitation marble. They have got hold of a good thing, apparently—a durable substance that can be made in any shape and of any colour that may be desired—and yet they put it out of court, as far as any architect is concerned, by their fashioning it to imitate marble. The people who enamel slate are just as wrong-headed. If only they would accept their process and their materials and supply us with plaques of enamel, olive green, pompeiian red, blue of the lapis lazuli, and yellow of the sunflower, with strips of grey and black to frame them, what an excellent wall-lining we should have, and how glad we should be to use it! As imitation marble one simply disregards it or relegates it to the underground

lavatory as its proper destination. In time, I think, the world will come to see the stupidity of manufacturing imitations, and we shall have the Chancellor of the Exchequer as an early step levying a heavy tax on all goods that are sent into circulation as imitations. Time was when the manufacturer had the courage of his material and his knowledge. He knew the capabilities and limitations of his wares, and in what direction to develop their characteristics and extend the area of their usefulness. The merchant accepted his judgment on these matters, and the article was sold on the strength of the manufacturer's reputation as an able craftsman. Wedgwood's pottery and Gillow's furniture are handy examples of such trading. Since then we have seen the rise of the salesman, who takes upon himself to discover what the public wants and from his experience to dictate to the manufacturer how he should make and present his goods. At first sight this seems a logical and convenient arrangement, for the customer can seldom get in touch first hand with the producer. But the situation is not really as described. The public does not know really what it wants. It has no confidence in its own judgment. It is unable to describe its vague preferences; it requires to have its choice, not too obviously, settled for it. Having no convictions of its own, it is thankful to be assured that the article selected will sustain victoriously the criticism of its friends, and one prevalent form of this confidence is got by the paralysing statement that it is a copy of an approved antique. Apart from other considerations dependent upon his success as an able salesman, the showman has to be an expert, in order to classify his goods, in the matter of styles, and to talk persuasively about their delicate nuances, etc. He becomes the dominant feature in the transaction, and, having probably the conduct of a large emporium, he has to post himself up in the current pseudo-cultured talk about a quantity of diverse goods about which he cannot possibly know the methods of their manufacture and what should be their standard of excellence. His and his customers' ignorant requirements—ignorant, that is, of the resources of the material and the machines for its production—are transmitted to the manufacturer, to his great bewilderment, and, as the quantity of his trade is directly dependent on these specifications from the great selling firms, he sets himself to answer these artificial problems and to compel his machinery to force his material into these unnatural channels. Under these conditions, of course, construction suffers. The article to be copied is generally a hand-made one, and it is demanded that the accidents and irregularities of the original, due to the limitations of the workman's tools and the individuality of his hand, shall appear in the machine-made article. No good is going to come out of this method of meeting the demand for the necessary articles of life. The salesman is not competent, and can never be competent, to act as instructor of the public in the matter of their purchase of articles from his showrooms. He has other matters to consider besides suiting his customers—he has to bear in mind the nature of his firm's transactions with the manufacturers and his firm's annual stock-taking. He should be able to give to his intending purchaser the manufacturer's guarantee as to the worth and durability of the article, and he should be able to transmit to the manufacturer the nature of the requirements of his customers for the former to deal with to the best of his judgment and ability. The public—at any rate, the influential part of it—do know a good thing from a bad, a pretty shape from an ugly one, and, other things not being too greatly unequal, will choose the good in preference. It should be encouraged to stand a little more firmly on its feet. The advertisers on our hoardings have no doubt as to its taste in art, literature, and humour, and they set the best men they can find to minister to it. The publishers of cheap literature do honour to it, not only in the choice of the books that they issue and reprint, but also in the way they get up the books themselves. And these books must sell by the many thousand if there is any profit to be made off the adventure. They are dedicated "at" the middle and lower classes, and it is a most striking testimony to the assumed, and justly assumed, intelligent taste of their readers to read the catalogues of their publications.

The Future.

We architects of the XIXth century have not as yet come into our own. We have seen the rise and expansion of simply incalculable forces, the creation of powers that give us a new conception of time and space and a new conception of our mastery over the brute resistance of materials that we have to deal with. But so far we have let these powers have the mastery over us. Like the sorcerer's apprentice, we have called these forces into play without realising how they should be employed, and in the agitation of the moment we have set them to tasks, as he did, which were not really wanted, and, like him, have been inundated in consequence. Gradually we are learning, since there is no *deus ex machina* like the sorcerer to step in and save us, how to make use of these powers and what limits to set to them, and we shall emerge from the welter of their products endowed with a set of trusty servants on whom we can call to aid and further us in our work, and relieve us of the mass of drudgery that such work entails. In a right acceptance of their mechanical help lies our hope for the future, so far as our construction is concerned, and in the wise development of their possibilities, as well as in the temperate use of their amazing facilities, will our course of life be shaped. At present our new means of expansion have brought us together in crowded juxtaposition; industrial centres have increased to an unwholesome degree; poverty and want of employment (that were to be abolished in the Paradise of Machinery) are increasing, and the specialisation of labour, directly due to the use of machines, is taking the heart out of the workman. The inhabitants of Erewhon recognised the tyranny and voracity of the machine, and whilst the matter was yet in their hands they called upon the inventors and constructors of these monsters to desist, and the industry was compulsorily stopped; the few machines that were not broken up were interned in appropriate museums to rest in undistructive idleness. We are taking the less drastic but more practical course in setting ourselves to discover and define what are and what are not the services that we should ask of them. As far as the machines themselves are concerned, they are ready to undertake anything and everything, and theirs is no idle boast. But the real thing in life is humanity itself, and the pulse of humanity flows in the veins of human beings, not in steam-pipes. Art is man's message to man, and art permeates every fibre of the healthy sensitive individual. It is not an attribute that some are endowed with or have the opportunity or leisure to cultivate; it is not a veneer that can be purchased or acquired; it is integral, and it is what makes life to each of us precious. It is this sense of the brotherhood of man, of the unfortunate as well as the fortunate, that has raised the monuments of the last century—the buildings, such as the board schools and public libraries, the museums and picture galleries, that will be the real evidences of the art of the XIXth century."

THE ARCHITECTURAL ASSOCIATION:

SILVER MEDAL DRAWINGS.

ONE of the first things we notice on looking at the designs submitted for the Silver Medal at the Architectural Association is that hanging side by side are two designs differing considerably in character, one labelled "Concert Hall for a County Town" the other "Concert Hall for a Garden Suburb," yet both apparently entered for the same prize. Puzzled by this, we consult the Brown Book, to discover that the subject set is a "Concert Hall for a County Town or Garden City." This, we confess, puzzles us still more. What exactly does this title mean?

It can hardly mean that a county town and a garden city are one and the same thing, for obviously they are not, as a matter of fact; but it might possibly mean that it is to be taken as such for the purposes of this competition—that if they are not the same thing they ought to be and that the concert hall is to be designed as if they were. On the other hand, we might imagine it to mean that designs are required for one of two things, at the discretion of the competitors—either a concert hall suitable for a county town or one suitable for a garden city, that competitors may choose which they please, and that the designs will be judged on their merits. Only in this case the difficulty of judging seems to be greatly increased without any compensating advantage, and such a method of conducting prize competitions is, as far as we are aware, without precedent.

It seems evident from the use of the word "county," instead of "country," that there was an intention to convey a definite idea of the character of the town to be expressed in the designs, otherwise we might have thought that what was intended was just any provincial town as distinct from a capital city, and that a concert hall was required on a less scale of magnificence than would be demanded in a metropolis, but otherwise of no special character. Then, again, we notice that the award goes to a design which is supposed to be given the special character of one which is erected to the memory of a national hero, though we find nothing about this in the programme. So that altogether we are a little uncertain as to what it is the competitors are trying to do.

As one design is for a provincial town, another for a garden city or a county town, and one for a garden suburb, while two are for a concert hall only without any further title, some of the competitors seem to have been rather uncertain about it, or to have adopted the view that they could send in which they pleased, with the result that the designs vary considerably in character and scale of magnificence—a variety too great for a building the character of which is definitely laid down and distinctly understood. The award seems also somewhat to support this view, as the Silver Medal goes to a building which, we suppose, apart from the national hero, is considered to be of a scale and general treatment adequately to express something of the distinction and character of a county town—the centre of county society and administration, education and culture—as distinct from a provincial town of equal size and wealth; while an Honourable Mention goes to a design of less monumental magnificence, more rustic, and less definitely civic in character, giving more the suggestion of a garden city or even perhaps of a garden suburb. Both these designs are admirable in their different ways, but we think their ways should not be so different as this if intended for the same thing—to say nothing of the design by "Allegro," or "No. 7," or even "Just in Time," which surely should not be expected to compete with such works as Mr. Home's winning design, or those by "Hopper," "Nemo," "Falima," or "Amphion"; but then we are not quite sure that they are.

Apart from this competition, however, the point seems to us to be important. A building, of course, is an organic growth, its form determined by its own nature and requirements, but, like other organisms, its growth is influenced by its environment. The more clearly the distinct character of this environment is defined the more clearly it can be expressed, or, at any rate, the attention of the student is directed to the fact that it ought to be expressed.

It seems to us that it may be in this direction that these studies in the ideal can be more intimately related to actual life, and so become more really "practical" than by the insistence on such arbitrary cast-iron regulations as those of the London County Council, which are merely rough-and-ready rules of a local and, it is to be hoped, temporary character, having no architectural significance whatever.

The site being an acute angle between two radiating streets, the general shape of the building should be arranged to fit it. Being an acute angle, any oblong form placed on the central axis creates return frontages which, we think, are just sufficiently removed from being parallel to the street fronts as to create an unpleasant effect. The longer and less unbroken these lines the more this defect is apparent. In Mr. Home's design, approximating to a square, the return lines are shortened, and this effect is diminished; but, all the same, we are inclined to think the general

form of the building is wrong in idea, however well it works out in detail. Not only does the plan of the building and the lay-out of the gardens show no relation whatever to the slope of the radiating avenues—being designed as if they were parallel streets—but the shape of the hall itself is hardly, we think, quite the most characteristic one for a concert hall.

From both these points of view we think that the circular design of "Hopper" is more on the right lines, although, being a much more difficult treatment, it is not perhaps so well worked out. The first floor corridor wall being carried over space is a grave defect which creates a misleading appearance in the elevation, and the entrance block and side projections are not perhaps altogether happy in shape or well connected with the circle. For all that it is an extremely interesting design.

"Nemo" also shows an attempt to meet both these points with an octagonal hall rising through lower outbuildings which are rectangular in shape. Here the main skylines of the side elevations are well broken up by the octagon and by the porch. The entrance block, however, is perhaps big, and lacks compactness, with the result that it is rather overpowering in the side elevation. This is another interesting design, but not so neat, compact, and finished as "Hopper."

The design by Mr. Ross, which obtains the Honourable Mention, apart from the fact that, like the winning design, the general form of the structure is not exactly characteristic of a concert hall, and does not show the influence of the radiating streets, is a simple, pleasing design, the interior of which, we think, is particularly charming. Perhaps the side corridors look a little narrowin proportion to the hall, and exception might be taken to the treatment of the entrance with the gallery entrance in the centre, and to the coupling of the large order which tends to block up the entrances.

We have not left ourselves space to deal with all the designs, but we might just refer to the startling contrast afforded by "Never Again" and "No. 7." Are these designs really intended to express the same idea under similar conditions?

If "No. 7" could only acquire some of the excessive self-confidence of "Never Again," and give in return some of his own refinement and delicacy of sentiment, it might be better for both. "No. 7," we believe, may yet be No. 1, for there is something in his elevational treatment which appeals, and his obvious defects of plan seem due simply to ignorance of the requirements and proper arrangement, which is soon put right.

It is pity that "Never Again's" idea is not more worthy of its forcible expression.

STATUE OF CAPT. COOK, WHITBY.

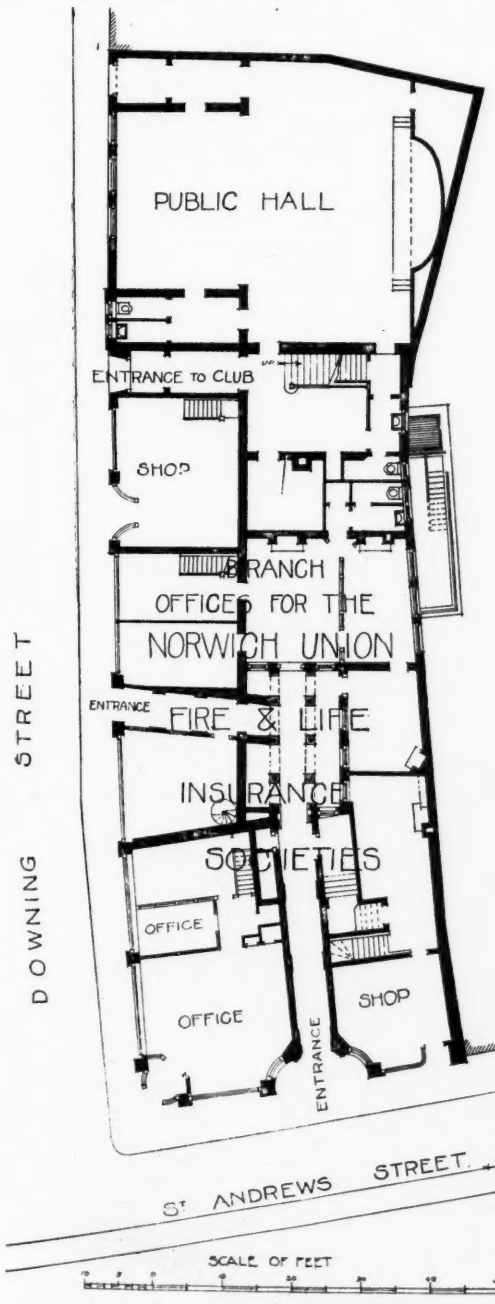
Mr. John Tweed has been appointed to be the sculptor of the statue which will be erected in Crescent-gardens, on the West Cliff, Whitby.

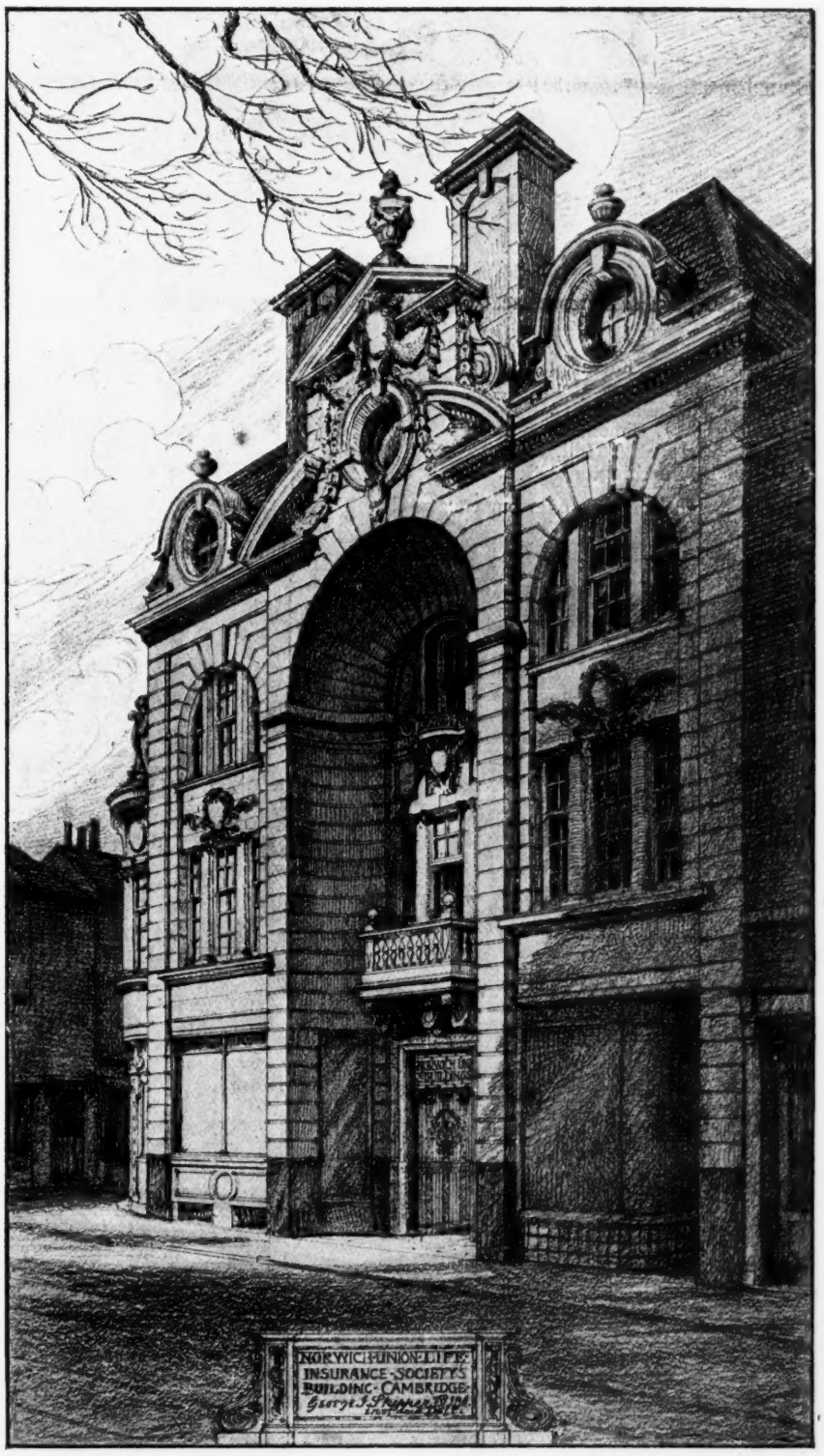
NORWICH UNION BUILDINGS, CAMBRIDGE.

THE perspective view illustrated below with the plan show the building recently erected by the Norwich Union Life Insurance Society to provide office accommodation for the extended business in Cambridge of the Norwich Union Fire and Life Insurance corporations. The frontage to St. Andrew's-street is comparatively narrow, as the plan indicates. As the site was large, there was sufficient space at the rear and on the upper floors alongside Downing-street to provide accommodation for the Cambridge Liberal Club and a public hall.

With the exceptions of the plinth and central doorway, which is in deed red polished granite, the whole of this front is in Ancaster stone.

Mr. Wm. Saint, contractor, of Cambridge, carried out the whole of the work. Mr. Bilby was clerk of the works. The design of the building and the perspective are both the work of Mr. George J. Skipper, F.R.I.B.A., of Norwich, with whom Mr. F. W. Skipper was then associated as partner.





Norwich Union Insurance Building, Cambridge.
Mr. G. J. Skipper, F.R.I.B.A., Architect.

LONDON AND PROVINCIAL BANK, LTD., NORWICH BRANCH.

THERE was considerable difficulty in planning this building owing to the irregular shape of the site. With this difficulty overcome, the needed accommodation on the ground floor was provided, as shown on accompanying plan. The bank occupies all the ground floor.

On the first floor are offices, and on the second is the residence for the caretaker.

Further description is hardly necessary except to explain that the cupola was not carried out owing to rights of light.

Mr. J. S. Smith, of Norwich, was the general contractor, and Mr. Potter, of Norwich, the stonemason. The whole of the front is executed in Portland stone, except the two columns to doorway, which are in grey polished granite.

The design is by Mr. George J. Skipper, F.R.I.B.A., architect, of Norwich, with whom at the time Mr. F. W. Skipper was associated as partner.

COMPETITION NEWS.

Manchester Library and Art Galleries.

Supplementing our remarks last week (p. 750) we announce as follows the names of the ten competitors who have been selected to prepare designs for the Manchester Library and Art Galleries :—

Messrs. H. Percy Adams and Charles H. Holden, London.
Mr. Robert Atkinson, London.
Messrs. Bradshaw & Gass and Mr. Arthur J. Hope, Bolton.
Messrs. Cooper & Slater, Blackburn.
Messrs. Crouch, Butler, & Savage, Birmingham.
Mr. R. Fielding Farrar, Leeds,
Messrs. A. Graham Henderson and J. R. Hacking, Glasgow.
Mr. Frank W. Simon, Liverpool.
Messrs. Warwick & Hall, London.
Messrs. T. Worthington & Son, Manchester.

To these gentlemen we offer our congratulations.

Bradford Royal Infirmary Extension.

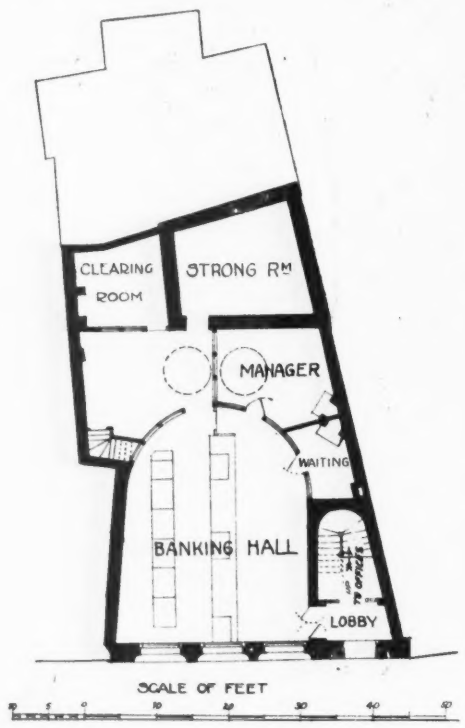
The award in the competition for the Bradford Infirmary Extension, advertised in our issue of December 31, 1910, has been decided by the assessor, Mr. Keith D. Young, F.R.I.B.A. The design of Mr. William A. Pite, F.R.I.B.A., of London, has been placed first; that of Mr. F. R. Halford, of London, second; and that of Mr. Arthur Marshall, A.R.I.B.A., of Nottingham, third. Forty-four sets of designs were sent in, represented by 350 strainers.

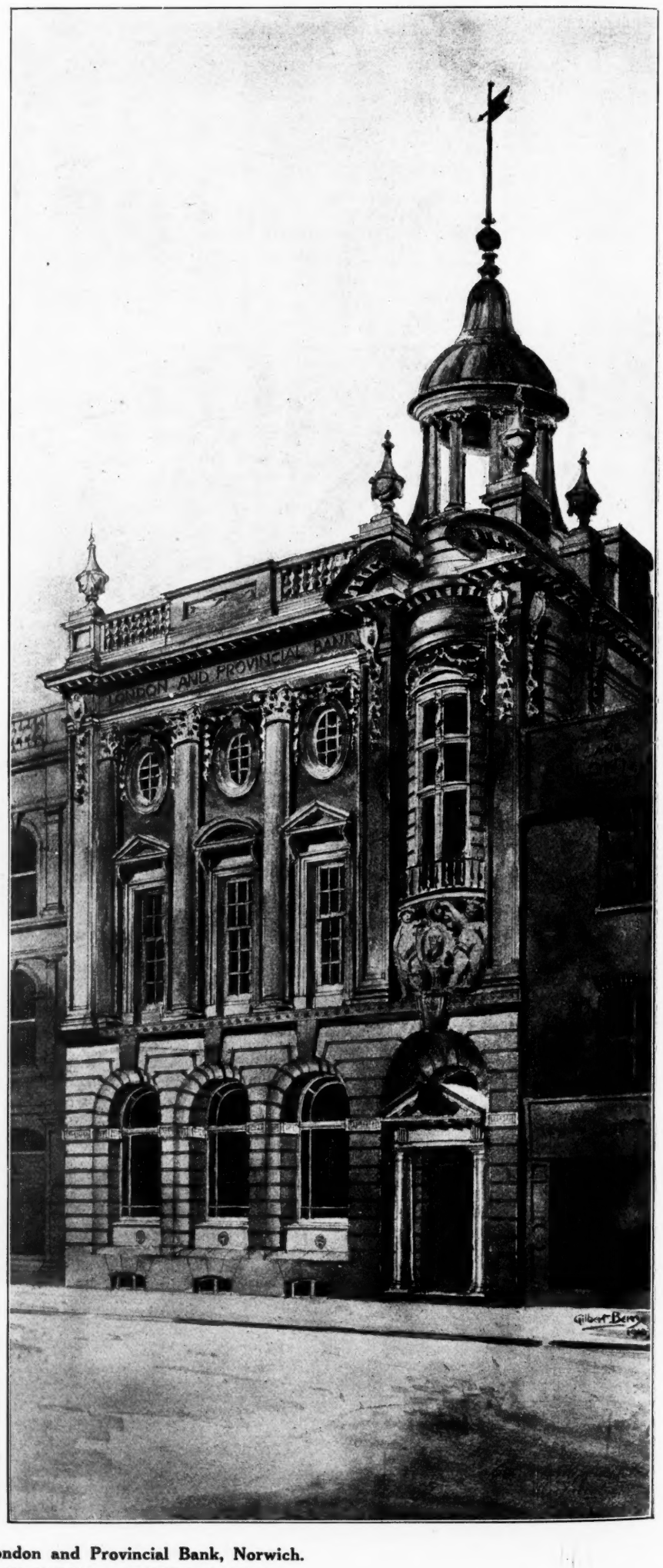
Coronation Hall, Ulverston.

Messrs. Austen & Paley, the assessors in the limited competition, have approved the designs of Messrs. Settle & Brundrit for a Coronation Hall at Ulverston, to provide accommodation for 800, with refreshment-rooms, etc. The estimated cost is 5,000*l*.

Australian Federal Capital.

Advices received by the last Australian mail state that the Department of Home Affairs





London and Provincial Bank, Norwich.
Mr. G. J. Skipper, F.R.I.B.A., Architect.

for the Commonwealth has prepared a statement for the information of architects intending to compete for the prize of 3,000*l.* offered for the best designs for the laying-out of the Federal capital. The statement referred to sets forth that the city is intended to be the official and social centre of Australia, and for the purpose of the designs the population is to be taken as 25,000. Special consideration must be given by designers to the allocation of appropriate areas suitably situated and embracing sites for the following:—Houses of Parliament (should be so placed as to become a dominating feature of the city. The building will probably have a frontage of 600 ft. and a depth of 200 ft.); residence of the Governor-General, residence of the Prime Minister, public offices, courts of justice, places of public worship, mint, national art gallery and library, State house, printing office, government factories, university, technical colleges, city hall, general post-office, museum, central railway-station, railway marshalling yards, military barracks, criminal and military courts, gaol, hospitals, national theatre, central power-station, gas-works, markets, stadium, parks, and gardens. The statement proceeds:—"The occasion for the design of the Federal capital city of the Commonwealth of Australia is unique in recent times, and it is expected that competitors will embody in their designs all recent developments in the science of town planning. The Conference held under the auspices of the Royal Institute of British Architects in October last, at which many authorities on the subject of town planning were present, must have a marked influence upon city design from the utilitarian, the architectural, the scientific, and the artistic standpoints."

BOOKS RECEIVED.

How to Manage a Suction Gas Producer. By W. A. Tookey. (London: Percival Marshall & Co. 1s. net.)

The Port of Grimsby and Immingham. With a prefatory note by Sir Geo. Doughty, M.P. (Grimsby: W. H. Jackson & Co. 6d.)

Calculation of Columns. By Theodor Nielsen. (London: E. & F. N. Spon, Ltd. 4s. 6d. net).

The Essentials of a Country House. By R. A. Briggs, F.R.I.B.A. (London: B. T. Batsford. 7s. 6d. net.)

A History of Architecture in London. By W. H. Godfrey. (London: B. T. Batsford. 7s. 6d.)

GENERAL NEWS.

Coronation Honours.

The long and interesting list of Coronation Honours includes names which are well known in the artistic and municipal world. To Sir Ernest George, A.R.A., we refer on p. 774. The archæological work of Sir Arthur J. Evans, F.R.S., deserved recognition, and Sir Frederick Eaton, as Secretary to the Royal Academy, has been a prominent man for many years; his book on the Royal Academy is a standard work of reference. Sir Frank Short, R.A., who succeeded the late Sir J. Seymour Haden as President of the Royal Society of Painter Etchers, has achieved much and has risen quickly. The Knighthood bestowed on Mr. Claude Phillips, late Keeper of the Wallace Collection and a great scholar, was well earned. Mr. W. H. Lever, who receives a Baronetcy, has been one of the leading spirits in the town-planning movement, his Port Sunlight village being among the best examples of housing reform in industrial communities. Mr. Akers-Douglas, a new Viscount, will be remembered as First Commissioner of Works, and Sir James Bell won distinction as Town Clerk of the City of London. Sir J. Purser Griffith is Engineer to the Dublin Port and Docks Board and served on the Royal Commission on Canals.

The Coronation.

The President of the Royal Society of Antiquaries of Ireland, Dr. Robert Cochrane, I.S.O., F.R.I.B.A., Inspector of Ancient Monuments for Ireland, has accepted the invitation of the Earl Marshal to be present at the ceremony of his Majesty's Coronation in Westminster Abbey.

The Bull Hotel, Rochester.

All votaries of Charles Dickens will be interested to learn that the Bull Hotel, of the "Pickwick Papers," will be put up for sale at the Mart on July 7. The old posting-house stands in the High-street, and has a large yard, with thirty-five sitting and bed rooms, and other apartments, and a recently-added restaurant and bar.

Wye Valley Excavations.

The search proceedings now going on at Chepstow, about half a mile up the river towards Tintern, have caused considerable interest, though some degree of scepticism prevails regarding the likelihood of Dr. Owen finding, as he thinks he will, evidence that Bacon was the real author of the plays and sonnets hitherto attributed to Shakespeare. Apart from the literary interest in the adventure there is the engineering side of it; and it may be recorded that the pumps used for sinking purposes are the "Pulsometer" steam pumps, manufactured by the Pulsometer Engineering Company, Ltd., at their works at Reading.

Bishop Ellicott Memorial, Gloucester.

A memorial tablet, the gift of Sir William H. Marling, of Stanley Park, Stroud, has been placed over the monument to the late Bishop Ellicott in the south transept, Gloucester Cathedral. The tablet is executed in bronze, with an alabaster frame, by the Bromsgrove Guild, after the design by Mr. F. W. Waller, architect to the Dean and Chapter.

Geological Survey.

The Board of Education has issued its report for the year 1910 on the Geological Survey, the Geological Museum in Jermyn-street, the Science Museum at South Kensington, and the work of the Solar Physics Committee. Geological maps. (Wyman. 9d.)

Coronation Celebrations and Fire Precautions.

The danger of fire in connexion with the impending Coronation celebrations, as far as the public are concerned, are considered by the British Fire Prevention Committee to be so grave that they have issued a notice regarding fire precautions, which also includes some hints as to safeguards for the stands, decorations, illuminations, fireworks, etc. Included in the notice are the following clauses:—

The lighting of matches and smoking should be avoided by persons standing or moving in a crowd, and should be prohibited by owners of stands, balconies, etc.

The use of highly inflammable decorative materials, such as paper roses, muslin, cotton-wool borders, unless properly treated, and celluloid decorations should also be avoided.

Exits and stairs should be kept clear for all stands, balconies, rooms, etc., used as points of vantage, and buckets of water in good number, thick cloths, portable steps, and knives for cutting down draperies should be at hand.

Illumination devices must be fixed firmly with metal fastenings, *i.e.*, not with string or cord, and on no account placed on window ledges, balcony rails, or the like overlooking public thoroughfares without being properly secured.

Curtains, hangings, etc., should be removed from around windows where open lights are to be used and away from temporary wiring, fuse boxes, etc.

Buckets of water should be provided, also boxes of dry sand where electrical illuminations are employed.

Frontal, etc., for Altar, Westminster Abbey.

The Frontal and Dossal for the Altar have been specially worked by Royal Command, and will be presented to the Abbey by their Majesties. The Frontal is in pure gold and silver thread on cream-white damask, and has been modelled upon the example of the XVth century preserved in the church of Chipping Campden, in Gloucestershire. So closely has the archaic character been preserved that the stitches in defining the faces and bodies in the figure-work are made spirally round a central point—the method in vogue at the period—as distinct from the straight up-and-down stitch of the present day. The design, which was prepared by Professor W. R. Lethaby and students at the Royal College of Art, is itself based on the XVth century work. It represents in the centre the Crucifixion scene, with figures of the Blessed Virgin and of the Apostle St. John, the attitude and drawing of the figures closely following a very similar drawing on the Syon Cope. On either side towards the ends of the Frontal are escutcheons borne by three half-length angel figures supported on clouds, the escutcheon on the left bearing the Royal Arms of England and that on the right the traditional Arms of St. Edward the Confessor, the founder of the Abbey. The ground is of bold floral spraywork copied from the Chipping Campden design. The Dossal, of the same work, which is designed to cover the whole of the reredos over the Altar, represents two full-length figures, about 2 ft. in height, of St. John the Evangelist as a pilgrim and St. Edward the Confessor on either side of the Cross. St. Edward the Confessor is wearing a gold mantle and the crown on his head, while he holds up the ring which legend relates was sent him by St. John. In the lower corners are kneeling figures of King George and Queen Mary represented in profile and worked in gold and fine floss silk. The figures are about 12 in. high. The embroidery work was carried out by Messrs. Morris & Co., of Oxford-street, the damask being reproduced by the St. Edmondsbury Silk-weaving Works at Letchworth.

FIFTY YEARS AGO.

From the *Builder* of June 22, 1861.

The Style which should Characterise our Epoch.

An artistic Congress is to be held in Antwerp. An address which the committee have issued, after setting forth the question of artistic copyright as one to be discussed, proceeds to open the question why our epoch, superior in so many respects to former centuries, has not its own particular form of architecture.

"Our architects, long before us, have recognised an evil the cause of which cannot be attributed to them. Nevertheless, let us consult history. We see in all great epochs a close alliance between the architect, the painter, and the sculptor. Egypt, Greece, and Rome have preserved many proofs of it. The ruins of Karnak at Thebes, those of the Parthenon at Athens, prove the power of that varied art, which called to its aid all the resources of the pencil, chisel, and compass. The Gothics had a similar aim; we do not speak of their cathedrals; even from the porch, covered with symbolical sculpture, to the choir in which a mystical light descends through a variety of glittering glass windows, all seems vivified: the most obscure recesses are peopled with images; the blue vault, covered with stars, gives an idea of the Infinite; the pious legends of the Middle Ages are to be seen upon the walls; the smallest object of furniture is a masterpiece, the importance of which is observed in that wonderful *ensemble*. Civil architecture does not remain beneath religious; our town halls confirm it; everyday life itself is surrounded by artistic marvels in which are blended, with an admirable harmony, architecture, sculpture, and painting. Renaissance, which does not separate these essential elements, has, as well as the Middle Ages, its form and its type, that may be traced in the history of architecture. Decadence itself, the last proof of which is the style of Rocaille, has produced monuments of indisputable value, wherein art, though degenerated, maintains a special and characteristic form. If, at our epoch, we want originality, is it not because we have abandoned the ancient alliance of the Fine Arts? Is it not because each confines itself to its particular sphere?"

Shall we not, when re-establishing the harmony which reigned among them, restore the unity, the original forms we want and for which we vainly seek in the recollections of the past? Is, in short, that question not solved by a reform in artistic instruction? And, in that case, what shall that reform be? Such an inquiry could only be fruitful in its results.

Bearing upon this, the Congress proposes to discuss the following questions:—

1. Is the expression of monumental art in harmony with the manifestations of modern ideas?

2. Is not the union of architecture, sculpture, and painting indispensable to monumental art? What reforms should be introduced in the instruction of the Fine Arts in order to establish that union?

3. Is it not in the union of architecture, painting, and sculpture that monumental art should find the elements of a new style, which ought to characterise our epoch?

EDITORIAL SUMMARY.

Our leading article is entitled "Some Forgotten Books." It is accompanied by illustrations of the Male Prison, Cork, St. Patrick's Church, Cork, and designs for churches.

In our second leading article (p. 773) the question is discussed of the invitation to the Royal Institute of British Architects to appear before the Committee of the House of Commons which examined the St. Paul's Bridge Bill.

Notes (p. 774) include: "Vandalism at Seville"; "St. Paul's Bridge"; "Sir Ernest George, A.R.A."

A paper by Mr. Halsey Ricardo, "Si Monumentum Requiris," read before the Birmingham Architectural Association, is given this week (p. 775).

Some remarks on the designs sent in for the Architectural Association Silver Medal Drawings appear on p. 778.

In the Correspondence Columns (p. 782) will be found letters on "St. Paul's Bridge"; "Garden Suburbs"; "Crittall Manufacturing Company *v.* London County Council."

The Illustrated Monthly Review of Engineering (p. 783) includes: "The Loetschberg Tunnel"; "Festival of Empire Buildings, Crystal Palace"; "Reinforced Concrete in Buenos Aires"; and Notes.

The Building Trade Section (p. 788) includes: "Ladders and Ladder Scaffolds"; "Projected New Buildings in the Provinces," etc.

An abstract of a paper by Mr. H. E. Henderson on the "Minor Domestic Architecture of Yorkshire," read before the Leeds and Yorkshire Architectural Society some time since, appears on p. 791.

Book Reviews (p. 794) include: "Memorials of Old Surrey"; "Colour Printing and Colour Printers"; "Lives of the British Sculptors"; "Cliff Castles and Cave Dwellings of Europe."

MEETINGS.

MONDAY, JUNE 26.

Royal Institute of British Architects.—(1) To present the Royal Gold Medal for the Promotion of Architecture, conferred by his Majesty the King, to Dr. William Dörpfeld, F.S.A., of the German Archæological Institute, Athens. (2) To read the following paper, "The Interleaved Heirloom Copy of the 'Parentalia,' and some Notes on the Wrens," by Mr. Lawrence Weaver, F.S.A. At the conclusion of the paper Mr. Weaver will formally present to the Institute the volume above referred to. 8.30 p.m.

TUESDAY, JUNE 27.

The Surveyors' Institution.—Reception at the White City, Shepherd's Bush, W. 8 p.m.

Junior Institution of Engineers.—Special general meeting of contributors to the Benevolent Fund. 7.30 p.m.

WEDNESDAY AND THURSDAY, JUNE 28 AND 29.

The Institution of Civil Engineers.—Conference on Education and Training of Engineers.

THURSDAY, JUNE 29.

Society of Antiquaries.—8.30 p.m.

SATURDAY, JULY 1.

Edinburgh Architectural Association.—Annual excursion to St. Andrews.

Junior Institution of Engineers.—Visit to Messrs. George Kent's Hydraulic Engineering Works, Biscot-road, Luton, and the straw hat factories of Messrs. Dillingham & Son, or of Mr. F. E. Shoosmith, both in Upper George-street, Luton.

CORRESPONDENCE.

St. Paul's Bridge.

SIR,—Perhaps the time is not now inopportune to point out that, except in the interests of tramway engineers and promoters, there is no real necessity for the proposed additional bridge across the Thames, which is already so be-bridged hereabouts as to be little better than a culvert, but there is a crying need of the rebuilding, or improving, of the existing Southwark Bridge, which, as standing, is practically useless, having regard to its position. Of course, this process would not make quite so many people's fortunes, it not being necessary to schedule any property, but, in spite of any opposition that may be anticipated owing to this, I beg to suggest that it is the proper course in the public interest; and there is a tramway scramble already established on the Surrey side for those who desire such things!

I further beg to be allowed to express my own and other's opinion that a necessity for carrying any more tramways across the river does not exist—they are already overdone and a nuisance in the streets, and far, far too numerous. Already, to our standing disgrace, the finest thoroughfare in London has been turned into a hideous tramyard, and it is time that portion of the public which pays for it all should cry, "Stop!"

There are other and more urgent improvements needed in the City; there are the widenings of Newgate-street, Fleet-street, Ludgate-hill, and the north side of St. Paul's Churchyard (which would provide a proper vista of St. Paul's), and the achievement of these will, I expect, occupy all the millions the Corporation have to spare, and, together with the rebuilding of Southwark Bridge, make a veritable improvement.

Trams, however, will only further congest the traffic. H. H. G. DENVIL.

Crittall Manufacturing Company *v.* London County Council.

SIR,—I have followed the correspondence regarding this matter with interest, but, seeing that the general contractor and the steelwork sub-contractors are, to my mind, alone responsible for the construction of the building from the architect's plans, etc., I have often wondered (as others must also have done) why sub-contractors employed to carry out the decorative part of a building, such as plaster, metal, wood carving, etc., should have to look to the general contractor for payment, seeing that nine times out of ten it has nothing to do with the general construction. Surely it would be quite as easy for the architect to pass the order for this part of the work on behalf of the client and to certify the account direct—as is often done even now—as to instruct the builder to pass the order and certify the account for him to pay; and it would then do away with the trouble which so often occurs regarding discounts, as, of course, no one ought really to expect a builder to order certain goods from a firm, the selecting of whom he has had no voice in, without getting something for his trouble and liability.

I certainly think from everyone's point of view it would be much better in the long run to split a building into two sections—*i.e.*, Construction and Decorative, and would like to suggest, seeing that it is such a big question, that one or two of our leading architects, contractors, and sub-contractors meet to discuss the question and get matters on a more definite and uniform footing. R. G.

Garden Suburbs: A Warning.

SIR,—As a member of the Garden Cities and Town Planning Association, and a strong supporter of the town-planning movement, I should like to point out a great danger into which those may fall who are in other respects so ably contributing to the realisation in practice of Mr. Howard's ideals.

If we are not very careful, the rush of modern business—I mean the tendency of the modern man to "rush a thing through"—will dump us into the pit of disaster; we must exercise great caution in dealing with our land, lest the development of it result in a mere jumble of well-planned and well-built houses; a thoughtless and hurried mixture of units, however well designed in themselves, will only produce a feeling of restlessness and destroy the dignity of the whole. Unless care and thought be given to the relation of each particular unit to the whole the result will be a botch.

Let us work as business men; but let us not allow consideration, care, and the sense of fitness to lapse totally into oblivion.

O. NEWBOLD.

INTERCOMMUNICATION COLUMN.

Flooring for Bakery.

SIR,—A correspondent of yours, signed "Baker," inquires for the best floor for a bakery establishment. I can strongly recommend the new material known as "Roadamant," and shall be pleased to send him particulars, or he can obtain them from the company of that name, 65, London-wall. It is a combination of granite and asphalt; as far as I can ascertain is non-slipping, durable, and has all the qualities suitable for roads, bakeries, and brewery floors.

ALBERT E. BULLOCK.

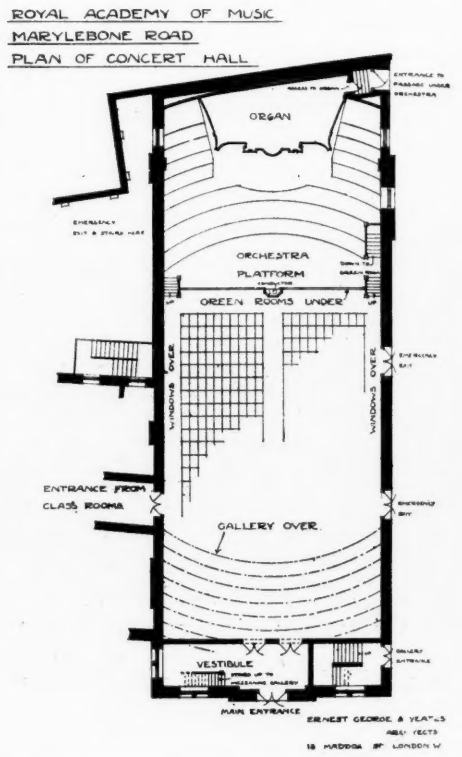
ILLUSTRATIONS.

Columbarium, Golder's Green, N.W.

IN this brick building, by Sir Ernest George and Mr. A. B. Yeates, the floors are of concrete, with marble paving. The vaults on the floor level are fitted with bronze doors. Messrs. Lawrence & Sons, of Bracknell, were the makers of the bricks, and Messrs. Stuart's Granolithic Company supplied the steps. The contractors were Messrs. Dove Bros., of Islington.

Royal Academy of Music.

AN illustration of the exterior of this building was published in the *Builder*, May 21, 1910. The Concert Hall, with its waggon-roof of ferro-concrete, top-lighted, forms one wing of the



building, which will be occupied by students in the autumn. Sir Ernest George and Mr. A. B. Yeates are the architects, and Messrs. G. E. Wallis & Sons, Ltd., of Maidstone, the contractors.

Brighton Grammar School.

THE position of the buildings, as shown upon the drawings, was decided upon for the following reasons:—

1. Aspect of sun in *every* classroom.
2. To preserve as large an area as possible for playing fields.
3. Approaches from the quietest road for the majority of the boys, and avoiding the noise of the trams in Dyke-road.
4. The adaptability of the levels, and being enabled to plan the paved playground adjoining the playing fields, properly grouped for senior and junior boys.
5. The architectural composition of the buildings upon the site, as shown on the sketch perspective, and preserving an excellent view of the school as seen across the playing fields from Dyke-road.

The design was placed second by the assessor.

EDWIN COOPER, F.R.I.B.A.

LANGHOLM BURGH WATERWORKS.

The Langholm Town Council instructed Mr. Harry W. Taylor, A.M.Inst.C.E. (Messrs. Taylor, Wallin, & Taylor), Cathedral-buildings, Newcastle-on-Tyne, at the beginning of the year to examine and report upon their existing water supply with a view to its augmentation. The scheme recommended is to tap additional springs in the Terrona Valley, and construct a new service reservoir of 250,000 gallons capacity with a new belt system of distributing mains in the town. At the last meeting of the Town Council this scheme was approved, and instructions were given for the necessary application to be made to the Local Government Board to borrow 5,800*l.* for the execution of the works.

MONTHLY REVIEW · *of* · ENGINEERING.

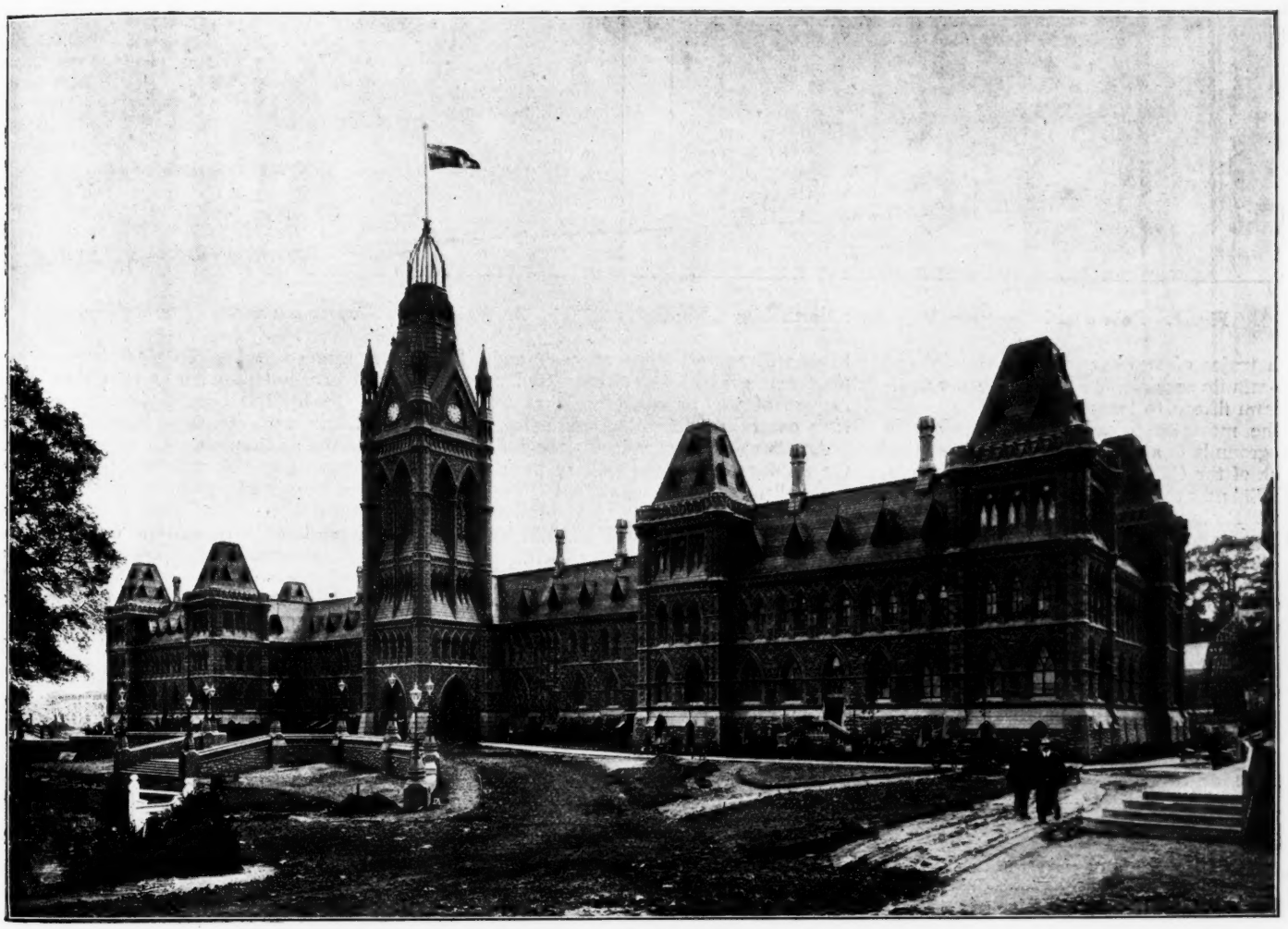


Fig. 3. Festival of Empire, Crystal Palace: Canadian Building.

FESTIVAL OF EMPIRE BUILDINGS, CRYSTAL PALACE.

ABOVE the many new buildings lately erected at Sydenham stands the Crystal Palace, in itself the most notable exhibition building the world has ever seen, and which forms a predominant and appropriate feature in the Festival of the British Empire.

Another permanent building, constituting the home centre of the Festival, is the former residence of Sir Joseph Paxton, standing just outside the Crystal Palace grounds, in the garden laid out by Paxton just sixty years ago. This pleasant retreat has been secured by the Hospitality Committee as the premises of the Dominions Club, where visitors from all parts of the Empire will find a home.

The Crystal Palace itself appears in a new guise this year, for, apart from the interior alterations, necessitated by the Fair of Fashions and numerous exhibits in the nave, the building has been rejuvenated by an army of more than three hundred painters and decorators, by whom some twenty-five tons of paint have been used. All the glass, represented by a million panes averaging 5 ft. long, has been thoroughly cleaned, and an awning, comprising 25,000 yds. of waterproofed canvas and weighing 25 tons, has been stretched from end to end of the glass roof, being supported by eighty-four sheet hawsers.

Outside the Palace two monumental stairways have been constructed in reinforced concrete leading from the main floor of the central transept to the upper terrace. The stairways, of which illustrations are given in Figs. 1 and 2, were constructed by the Empire Stone Company, Ltd., of Thanet House, Strand, from the designs of Mr. Burnard Geen, A.M.Inst.C.E., of Westminster, the Consulting Engineer to the Council of the Festival of Empire, and furnish interesting examples of reinforced concrete work.

The two stairways are L-shaped and differ in design only in the respect that they are of opposite hand, the lower flights turning to the north and south respectively. The height from main floor level to the terrace below is about 34 ft. 6 in.; the upper flights are 24 ft. 4 in. wide over all by about 75 ft. long, and the lower flights are 21 ft. 4 in. wide over all by some 83 ft. long. The steps are 14 in. wide with a 6-in. rise, the surfaces having been finished with a 1-in. layer of granolithic concrete applied as soon as possible after the bulk of the concrete had been deposited. The treads are grooved so as to give and secure foothold.

The landings are provided with sufficient fall towards the outside corners, and have suitable gullies and downpipes let into the corner columns, these being proportioned so that rain water passes away in a heavy storm without any flooding.

The stairways were designed for the superimposed load of 1½ cwt. per square foot, and include about 350 cubic yds. of concrete, mixed by hand in the proportions of 6½ cwt. Portland cement, 13½ cubic ft. washed sand of ⅛-in. gauge downwards, and 27 cubic ft. washed shingle of ¾-in. to ⅛-in. gauge. Ordinary mild steel bars were employed as reinforcement throughout.

Construction was commenced on February 10, and the concreting completed on April 13. The balustrades, which are not reinforced, were moulded and seasoned in advance at the works of the contractors, and were completely erected by May 9.

Special care was taken in designing the structure to provide ample strength in view of the fact that all centring had to be removed by May 11, when the last portion of concrete was only about one month old, and consequently had not attained more than two-thirds of its strength at the age of three months.

On May 12 the stairways were opened for use, and on that day the King and Queen passed down the north flight after opening the exhibition. It is estimated that during the same day at least 150,000 persons made use of the stairways, the crowd at some times being so dense as to prohibit movement almost entirely. Careful examination was afterwards made without revealing the slightest trace of any defect or injury. All the shuttering had then been removed, but temporary raking struts were placed under the main beams of the three upper flights in both stairways.

The short time in which the work was completed and the excellent finish obtained reflect great credit upon the contractors, while the general effect of the work is one upon which the designer is to be congratulated.

From the head of the stairways the visitor has before him an excellent view of the numerous buildings dotted about the grounds, which provide an ideal site with abundance of foliage, the background of the picture being provided by the wooded hills of Kent and Surrey.

Those who desire to make a rapid inspection of the structures erected by British Dominions over the sea will find ready means of locomotion in the electric railway designated the "All-Red Route." This line, constructed at a cost of 60,000*l.*, is equipped

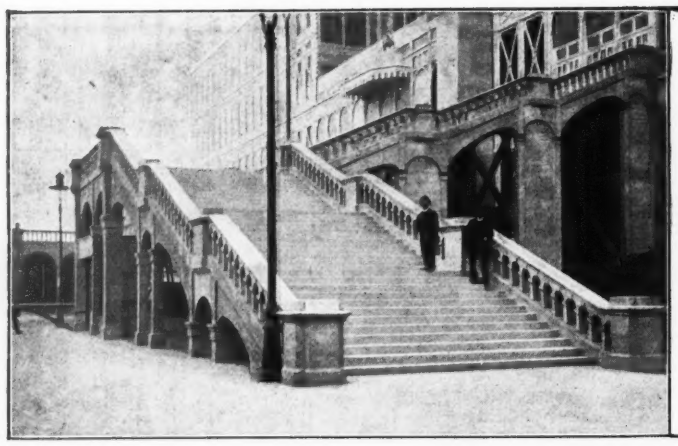


Fig. 1. Reinforced Concrete Stairway: North Flight.

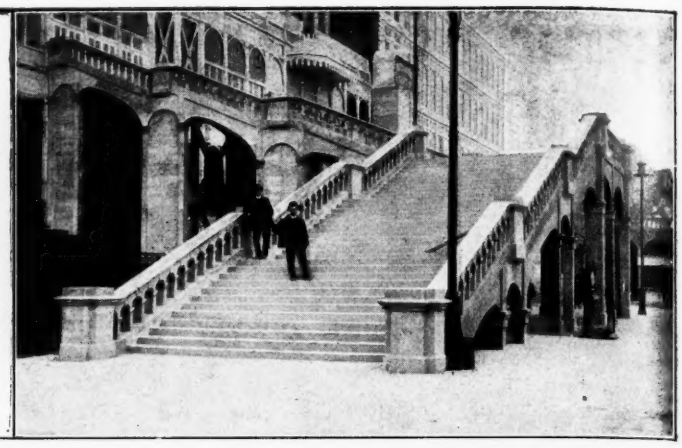


Fig. 2. Reinforced Concrete Stairway: South Flight.

with trains of two cars each, maintaining a one-minute service, and traversing the route in from fifteen to twenty minutes.

The most imposing temporary palace in the grounds is a reproduction of the central block of the Canadian Houses of Parliament, situated near the London, Brighton, and South Coast Railway-station, and the original of which stands on a rocky eminence overlooking the Ottawa Valley. The building is constructed to three-quarters full size, and, as may be judged (p. 783), it is an admirable example of the skill attained by modern experts in mimic architecture. Constructed at a cost of 40,000*l.* by the Dominion Government, this building consists mainly of timber, canvas, and plaster, and at first sight may be quite easily mistaken for a solid stone building.

Not far away is the Indian Palace, formed by the polygonal building with sixteen sides formerly used as a panorama. The original structure has been considerably altered inside and outside, not only for the purpose of making its appearance suitable to the Empire represented, but also to insure the safety of the public.

The original iron-framed dome, with a span of 123 ft. 6 in. and a rise of 27 ft., built some thirty years ago, was found on examination to have deteriorated very considerably owing to corrosion, and for the support of the new false dome it was found necessary to truss the existing ribs.

Fig. 4 is a diagrammatic half-section of the roof as altered. The old lattice ribs have been strengthened by the trusses indicated in thick black lines, the erection of these members having been conducted by the aid of scaffolding built up from floor level. In order to relieve the old ribs of dome action and to convert them into compression members of the remodelled trusses, the closing members of the new trusses were put in after having been heated so as to induce initial tension. The false dome added above to impart an Oriental aspect to the structure consists of light timber trusses covered with fibrous plaster.

At the present main entrance to the building there is a drop of 10 ft., the inconvenience of which has been obviated by constructing a flight of thirteen steps leading down to a raised platform 3 ft. 6 in. high above the floor, 12 ft. wide, and about 60 ft. long, with seven steps at each end. This platform constitutes a new and pleasing feature of the building, while at the same time overcoming a serious difficulty.

Another new feature inside the building is the reinforced concrete gallery built around the walls. This was constructed by Messrs. Humphreys, Ltd., of Knightsbridge, to the designs of Mr. Burnard Geen, A.M.Inst.C.E., who also was responsible for the other works executed in connexion with the Indian Palace. The gallery is 15 ft. wide, with columns 9 in. square, spaced about 19 ft. 6 in. apart and 12 ft. from the walls at the angles of the walls. The main beams measure 7 in. wide by 16 in. deep, and the secondary beams, projecting for 3 ft. as cantilevers, are 5 in. wide by 9 in. deep. Three out of every four beams are arranged at right angles to the walls, and the fourth beam is disposed radially. The floor slab connecting all the beams is 3½ in. thick. Access to the gallery is afforded by two flights of stairs, the surfaces of the steps and gallery being finished with a granolithic layer of 1 in. thick. The concrete was mixed by hand in the proportions of 6½ cwt. Portland cement, 13½ cubic ft. washed sand, and 27 cubic ft. washed aggregate. Considerable difficulty was experienced in getting the concrete to harden with the desired rapidity owing to the fact that the old building was completely enclosed with only one small doorway, but after further openings had been made and a current of air established the process of hardening proceeded rapidly. At first the shuttering was kept in place for four weeks in the case of the slab and for six weeks in the case of the beams, with the exception of those parts opposite the old doorway. After the additional openings had been made the two classes of shuttering were removed in ten days and eighteen days respectively.

The design of the gallery is of the very plainest description, and was considerably cut down for the sake of economy. For this reason the curb at the front edge of the slab was omitted, and the secondary beams were not all disposed radially from the centre of the building. The gallery was calculated for the superimposed load of 1½ cwt. per square foot.

Passing once more into the grounds, three buildings in Empire-avenue claim special attention. These are reproductions to three-quarters full size of the Australian, New Zealand, and South African Parliament Houses.

Fig. 5 illustrates the Australian building, the architectural features of which are shown by the half elevation and the structural features by the part section. Fig. 6 gives similar particulars of the New Zealand building on the opposite side of Empire-avenue, and Fig. 7 illustrates the South African building. Although these structures are of flimsy character, the details of construction are of considerable interest, as we can vouch by personal inspection before the timber framework had been covered by decorative material. Both of the buildings are covered with fibrous plaster,

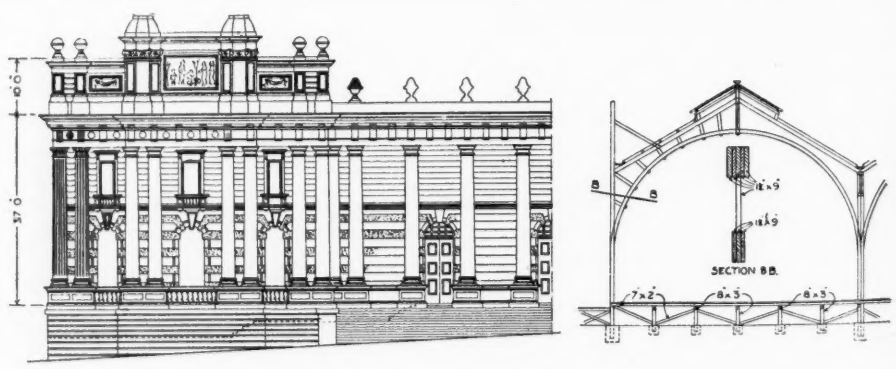


Fig. 5. Australian Building.

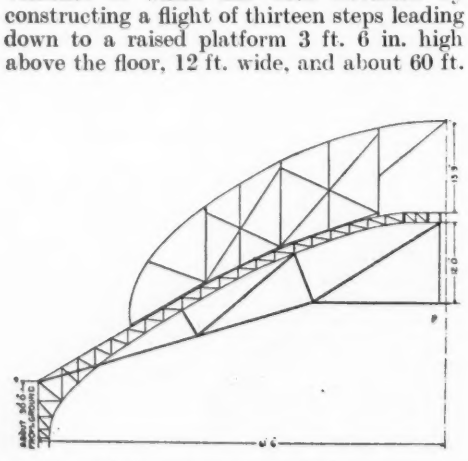


Fig. 4. Half-section of Roof, Indian Pavilion.

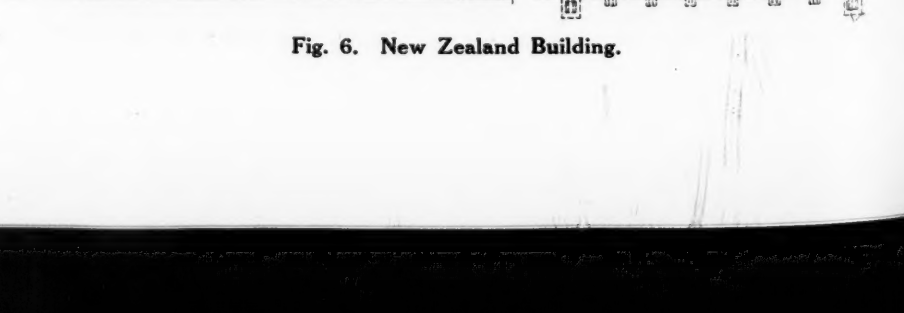


Fig. 6. New Zealand Building.

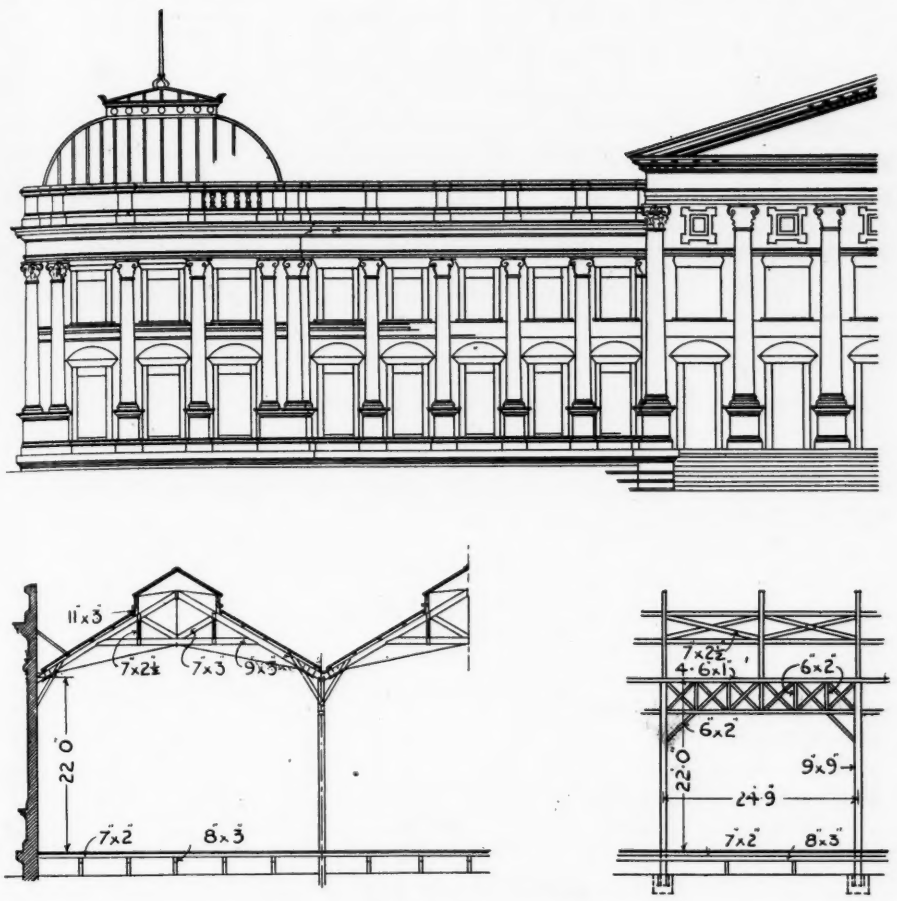


Fig. 7. South African Building.

painted so as to imitate as closely as possible the stonework of the originals, and the natural aspect of the structures is considerably aided by the well-grown trees bordering the avenue.

Many other buildings erected by Colonial Governments, railway companies, and industrial firms are scattered about the grounds, in addition to the Tudor Village, and numerous buildings and mechanical structures dedicated to the entertainment and amusement of visitors.

From the structural standpoint the buildings present no features of novelty and no advance in respect of fire-resistance. But it should be noted that the risk of fire cannot be great in view of the efficient fire service provided, and that the complete isolation of all the buildings in the grounds is in itself an admirable feature making impossible any extensive conflagration even supposing an outbreak in any one building to be allowed full scope.

Before closing these notes we may appropriately refer to the extensive installations made for the supply of light and power to the new city which has sprung up in the Crystal Palace grounds.

This department is under the direction of Mr. Albion T. Snell, M.Inst.C.E., M.Inst.E.E., who has had to supervise the operations of more than forty firms of engineering contractors, the collective cost of the works amounting to over 70,000*l.*

Electricity is supplied from a new power-station of 3,000-horse-power, erected and equipped in the grounds, with additional supplies from special cables laid by the South Metropolitan Electric Light and Power Company and the Beckenham Urban District Council.

Gas at high and low pressure is supplied by the South Suburban Gas Company through special service mains and two compressor stations, and a number of independent gas and oil plants are scattered about the grounds.

The All-Red Railway, the Empire Mountain Railway, the King's Lift, the Terrace Fountains, and numerous side shows account for a large proportion of the electric current required, the remainder being required for incandescent and arc lamps and searchlights. The All-Red Railway route alone is illuminated at night by 75,000 incandescent lamps of 16-candle-power, served by fifteen miles of wires. Altogether, this department of the Festival represents an engineering achievement of considerable magnitude, and the manner in which it has been accomplished does credit to all concerned.

REINFORCED CONCRETE IN BUENOS AIRES PORT EXTENSION.

THE contract awarded to Messrs. C. H. Walker & Co. for the new port works at Buenos Aires involves the reclamation of more than 200 acres of land, the construction of four new docks, with quays for over 5,000 lineal yds., and the building of warehouses covering about 100 acres of floor space, the total cost amounting to 5,500,000*l.* approximately.

An idea of the extensive employment to be made of reinforced concrete may be gathered from the statement that the works in this material involve some 200,000 cubic yds. of concrete, and no less than 19,000 tons of steel.

The reinforced concrete construction includes fourteen large warehouses, twenty sheds, eighty subways connecting the various buildings, and two granaries, all executed in accordance with details prepared by Messrs. Edmond Coignet, Ltd, of Westminster.

Six of the warehouses will be 415 ft. long by 119 ft. wide. Facing them will be a line of twelve transit sheds, each 354 ft. long by 98 ft. wide. The remaining warehouses are to be 354 ft. long by 69 ft. wide, and facing them eight sheds 354 ft. long by 98 ft. wide will be built.

The granary buildings will provide accommodation in the form of bins for the storage of 20,000 tons of grain, and the connecting subways will extend for the total length of 1¼ miles.

The warehouses will comprise basement, ground, first, second, and third floors, and a flat roof, the transit sheds being designed with basement, ground floor, first floor, and flat roof. All the buildings will be built of reinforced concrete, on the Coignet system, including retaining walls, columns, floors, roofs, walls, stairways, loading platforms.

The contract is said to be the largest yet entered into for the application of reinforced concrete. The engineers for the works are Messrs. Livesey, Son, & Henderson, MM.Inst.C.E., of Finsbury.

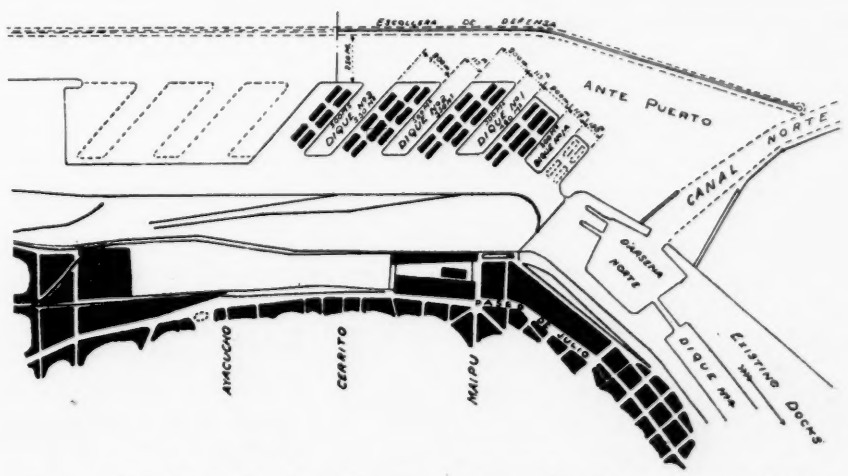
THE LOETSCHBERG TUNNEL.

COMMENCED at the end of 1906, the Loetschberg Tunnel will probably be completed soon after the end of next year. The advance headings of the tunnels pierced from Kandersteg and Goppenstein respectively, were connected on March 31 last, completing the connexion beneath the Bernese Alps and making an important step towards the accomplishment of an exceptionally arduous task.

Fig. 1 is a view of the Kander Valley at the north end of the tunnel and will serve to convey some idea of the country beneath which the new railway is destined to run. We are indebted to the Comité de Direction of the Compagnie du Chemin de fer des Alpes Bernoises for the photograph reproduced. Apart from tunnelling work forming part of the curves by which the railway is carried up to the level of the north portal, the Loetschberg Tunnel is nearly 9¼ miles long, passing beneath the Schafberg, the Gastheren Thal, and the Loetsch Pass, and terminating at Goppenstein in the Loetsch Thal. At Kandersteg the portal is about 3,940 ft. above sea level, and at Goppenstein the portal is 4,000 ft. above the same level. The completion of the tunnel will open up a much shorter route than that now available between this country and Brindisi, and, in conjunction with the Simplon Tunnel, will establish another direct communication between the railway systems of France and Italy.

Fig. 2 illustrates the procedure in the access tunnels, and Fig. 3 shows the gressive stages of work in the main tunnel.

On July 24, 1908, when the northern gallery of the tunnel had been advanced to a point beneath the Kander River an unexpected disaster occurred, which had the effect of stopping progress until February 15,



Buenos Aires Port Extension Works, showing reclamation wall near docks, warehouses, and sheds.

Fig. 1. Kandersteg and the Loetschberg Tunnel Scheme.

1909. This mishap was caused by a sudden irruption of the river into the works despite the assurance of geological experts that at least 300 ft. of solid rock existed between the bed of the river and the roof of the tunnel. Subsequent examination showed that the river bed was pierced by a hole some 200 ft. in diameter, and that the banks had caved in, with the result of forming a funnel-shaped opening some 500 ft. across. The enormous mass of loose material washed down filled up the workings for a length of nearly 4,000 ft., not only destroying the work of six months, but also causing the death of several men who were taken unawares by this disastrous failure.

In order to obviate the risk of anything of the kind in the future, it was decided to abandon the original line of the tunnel and to adopt a deviation which would assure the conduct of operations in solid granite throughout. This prudent decision meant the abandonment of a considerable part of the work already done from both ends and increased the total length of the tunnel by about 2,600 ft.

Notwithstanding the difficulties resulting from the adoption of a sinuous course and the corrections of levelling necessitated by the alteration of the original line, the connexion of the two advance headings was made with wonderful accuracy, as shown by the fact that the lateral error in the axes of the two galleries was only 10 in. and the vertical error only 4 in., the actual length of the tunnel being only 16 in. different from that computed by the engineers.

At the present time the tunnel is excavated to the full size for about 11,000 yds., the masonry lining is finished to the length of about 10,000 yds., while the various auxiliary works are in a very forward state.

The conduct of this important undertaking does great credit to all the engineers concerned, and particularly to M. Moreau, the chief engineer of the south gallery, and M. Rothpletz, the chief engineer of the north gallery.

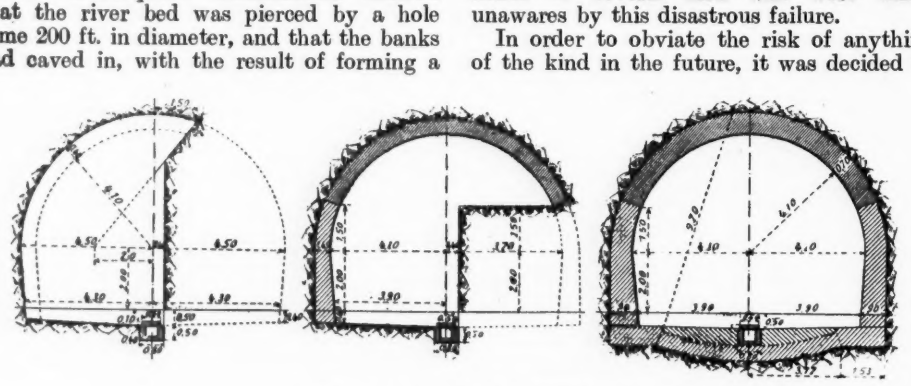


Fig. 2. Approach Tunnels.
(From "Genie Civil.")

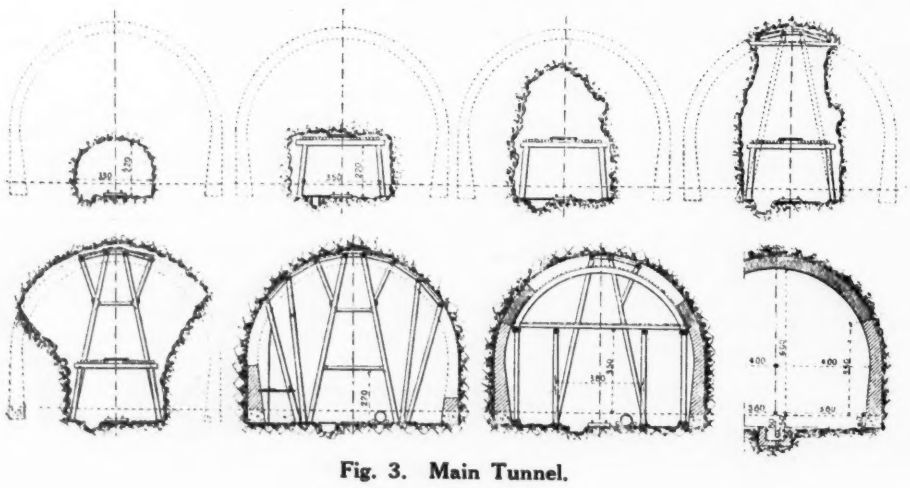


Fig. 3. Main Tunnel.
(From "Genie Civil.")

THE LATEST SKYSCRAPER.

THE Woolworth building to be constructed in New York will far surpass the standard already set by the Singer and Metropolitan buildings, and when completed it will be exceeded in height only by the Eiffel Tower. The site has a frontage of 155 ft. on Broadway, and extends back for some 200 ft. The foundations will be taken down to rock bottom, 110 ft. below street level. Commencing at the thirty-first floor a tower measuring 84 ft. by 86 ft. in plan will be built with vertical walls to forty-second-floor level, thence, with the sectional dimensions of 69 ft. by 71 ft., it will be taken up to the forty-seventh floor and continued to the fiftieth

floor with the dimensions of 59 ft. by 61 ft. The tower will then be carried upward in pyramidal form with five additional floors, and an observation gallery 730 ft. above the street, the total height above the same level being 775 ft. Taking into account two basement stories, the building will have the maximum height of more than 800 ft. The framework will contain about 20,000 tons of steel, and above the fifth floor the curtain walls will be of terra-cotta.

ENGINEERING NOTES.

Corrosion of Metal. In a paper read to the Iron and Steel Institute Mr. Percy Longmuir points out that the real problem of corrosion does not lie in the amount of metal lost by rust or decay, but in the influence exerted on the metal remaining intact and apparently unaffected. Deterioration is found which is not explained by mere loss of weight or by change in the normal composition of the metal. Evidence of chemical change in steel is not easily found, and although physical changes are apparent, these cannot be explained on the ground of definite change in composition. It is not easy to account for the brittleness induced in steel subject to corrosive action, for not infrequently a series of factors may be operating together, and it then becomes difficult to isolate a single factor. The author illustrates his remarks on this aspect of corrosion by the results of tests showing variations in the properties of steel cut from different parts of steel rails which had been exposed to corrosive influences.

Influence of Frost on Concrete. With the object of arriving at reliable data concerning the effect of frost on concrete and cement, Dr. Dieckmann tested nearly 500 specimens which he had prepared with the materials cold or heated to 24° C., and gauged with lukewarm water. The mixtures were prepared at the temperatures of 0°, and from 10° to 15° C., some of the specimens being hardened in dry air, and others moistened by periodical sprinkling during the process of hardening. The specimens were tested at the age of from two to sixty days, and they contained from 0 to 7·5 per cent. of common salt, so that the benefit of retarded freezing might be observed. Briefly summarised, the results of the tests were as follows: (1) The addition of salt to the extent of less than 2·5 per cent. has always the effect of increasing the resistance of cement and mortar, and the rapidity of setting. (2) Moistening during the process of hardening increases the final strength of concrete. (3) When allowed to set and harden at low temperature, concrete which commences to harden normally afterwards loses part of its resistance and its final resistance is considerably lower than that of similar concrete seasoned at higher temperature.

Revised Wiring Rules of the Institution of Electrical Engineers. After consideration for two years by a committee representing all interests concerned, the Institution of Electrical Engineers have now issued a revised code of electrical wiring rules, in place of the regulations which have been in force since 1903. An important feature of the new rules is that they constitute official recognition of modern developments in electrical installations, such as work on flexible systems, and with metal-covered concentric conductors. For power and heating circuits the maximum permissible current for conductors of different sizes is still based upon the rise of temperature, but the governing limit has been raised from 10 deg. to 20 deg. F. For lighting circuits the minimum size of conductors within a building is to be determined by the permissible drop of voltage, but the temperature rise is also to be taken into account, and copper conductors of less than No. 18 S. W. G. will not be permitted. With the object of obtaining reliable data as to the rise of temperature due to the passage of current the Institution enlisted the aid of the National Physical Laboratory to conduct tests, the results of which show that the figures formerly relied upon were not accurate. A table embodying the results is issued with the new rules, which have been accepted by the chief fire insurance offices, the electricity supply companies, and the Municipal Electrical Association, a body representing some 200 municipal authorities.

Tensile Strength of Concrete. Tests made at Cornell University on blocks of concrete measuring 6 in. square by 18 in. long are described by Professor A. P. Mills in the *Cornell Civil Engineer*, the object of the investigation being to determine values for the tensile resistance of the material as gauged by the behaviour of moderately large specimens.

The proportions and quality of the concrete were not specially good, and consequently the results cannot be taken as representing the strength of concrete such as is employed in reinforced work of the best class.

The materials consisted of Nazareth Portland cement, sand, and either limestone or sandstone as aggregate, the mixtures being in the proportions of 1 : 2 : 4 and 1 : 2½ : 5.

In many instances the particles of aggregate were broken across while the cement and sand remained intact, thus showing that with proper aggregates the resistance of the concrete would have been much higher.

Compression tests were also made of the same mixtures, and if the results are considered as a whole with due regard to the nature of the concrete they are useful as throwing some light upon the ratio of the tensile to the compressive strength of concrete.

The following are average values furnished by the tests:—

Kind of Concrete.	Proportions.	Tensile Strength.	Compressive Strength.
		lb. per sq. inch.	lb. per sq. inch.
Limestone ..	1 : 2 : 4	278	2,500
Sandstone ...	1 : 2 : 4	150	1,610
Sandstone ...	1 : 2½ : 5	129	1,467

Apollo Theatre, Rome. In a recent number of *Il Cemento* Signor Lei-Spano gives an interesting description of the new Apollo Theatre in Rome, a building with accommodation for 1,500 spectators, and including three circles constructed entirely in reinforced concrete. The auditorium is of elliptical form, the roof being carried by two trapezoidal beams with secondary beams all in the same material. A fine hall adjoining with the dimensions of 131 ft. long by 43 ft. wide, and devoted to the purpose of a restaurant, is situated above a row of shops and is also constructed of reinforced concrete.

The Derwent Valley Water Scheme. In a paper read to the Association of Water Engineers Mr. Edward Sandeman, M.Inst.C.E., gives full particulars of the great undertaking for the supply of water to the counties of Derby and Nottingham and the towns of Leicester, Derby, Sheffield, and Nottingham. The ultimate supply estimated at 33·3 million gallons daily will be divided in the following proportions:—Leicester, 9·8; Derby, 6·8; Sheffield, 6·8; Nottingham, 3·9; Derby County, 5; and Nottingham County, 1; these figures representing millions of gallons daily. The scheme provides for the construction of five impounding reservoirs with the aggregate area of 901 acres, and the collective capacity of 10,067 million gallons, about fifteen acres of filter beds at Bamford, a large service reservoir at Ambergate, and some 100 miles of aqueduct for distributing water to the various authorities concerned. At present, however, only two reservoirs are under construction, both of these being on the River Derwent and termed the Howden and Derwent reservoirs, their capacity being 1,940 and 2,000 million gallons respectively. The reservoir dams are being built in millstone grit brought by rail from Grintleford, and the maximum thickness of masonry is 176 ft. in each instance. A temporary village has been built for housing workpeople at Birchinlee, and the board have constructed a railway line about 7 miles long for the transport of materials.

Elephant and Castle Subways. The subways providing safe means of crossing from side to side of the busy and somewhat dangerous traffic centre at the Elephant and Castle, comprise a spacious central hall connected by five passages to different points at the end of the converging main streets. The works represent the first example of tubular iron-lined tunnel construction in London close to the surface, and much credit is due to Mr. Arthur Harrison, M.Inst.C.E., the Borough Engineer, for the excellent character of tne general design, the execution of which was attended with considerable difficulty owing to the large volumes of underground water encountered, and the extensive diversions necessary in the case of water mains, gas pipes, electric conduits, and sewers. The central hall has brick walls 3 ft. thick with a ¾-in. asphalt waterproof course, and the roof consists of steel girders embedded in concrete. The whole of the interior, including the hall and radial passages, is covered with white glazed tiles, the ceilings being faced with Keen's cement. Although the subways were formally opened early this month, an extension between the opposite sides of New Kent-road is still in progress and still affords an opportunity for those who are interested in such works to inspect the method of construction adopted. The contractors were Messrs. Perry & Co., Ltd., Bow.

New Pumping Station, Walton-on-Thames. Constituting an important addition to the works of the Metropolitan Water Board, the pumping station opened recently close to the Walton and Chelsea reservoirs at Walton, was constructed from the designs of Mr. J. W. Restler, M.Inst.C.E., under powers granted by the Southwark and Vauxhall Water Company's Act, 1898. The intake, situated on the south bank of the Thames, conveys water under the towpaths, supplies being regulated by a set of Stoney type sluices. After entering the intake chamber the water passes through a series of gratings, by which leaves and floating substances are removed, and is then conveyed along an open conduit to the pump chamber. The conduit is about 1,450 ft. long and of dimensions adequate for conveying 200 million gallons of water daily. The pumping station is housed in a handsome block of buildings in brick with stone dressings, the design being simple and at the same time thoroughly sound and effective from the architectural standpoint, the appearance of the chimney-shaft being particularly commendable. The four main pumping engines have the collective capacity of 100 million gallons per day, and the mechanical plant generally is of the most modern types. The contract for the buildings, coal storage bunkers, and the conduit was executed by Messrs. Dick, Kerr, & Co., Ltd., and the machinery contract was entrusted to the Thames Ironworks Shipbuilding and Engineering Company, Ltd.

Fire Resistance of Floors. A recent issue of the *Journal* of the British Fire Prevention Committee contains a convenient summary of the results furnished by twenty-eight tests conducted at various dates on fire-resisting floors. All the tests in question have been fully described in Red Books, and the object of the present summary is to collect under one cover the general results in a manner suitable for reference. Apart from explanatory notes, the particulars are given in the form of two folding plates relating to floors classified as affording "full protection" and "partial protection" respectively.

The reader should note that the tables only refer to a few of the numerous types of construction on the market, and that there are many excellent floors which have not been submitted for test by the Committee. It should also be noted that the tables are merely summaries intended as a general guide to the forms of construction to which reference is made. Further details can be obtained from the original reports, the number and date of each being given in the two tables.

THE BUILDING TRADE.

LADDERS AND LADDER SCAFFOLDS.

THE familiar ladder is one of the many valuable legacies inherited by the modern building contractor from remote antiquity. While the ordinary form of this useful accessory has remained without material change for a very long time and will probably do so for many years to come, various new types for special purposes are now on the market, and brief reference to some of these will be convenient before we pass on to discuss the utilisation of ladders in scaffold construction.

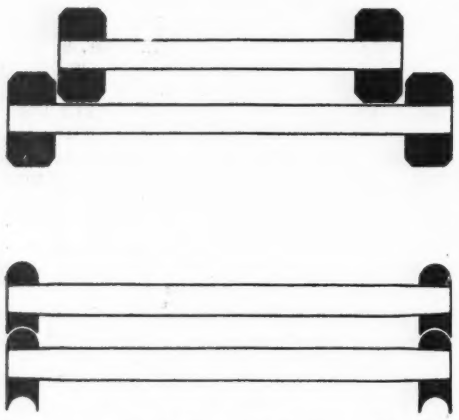


Fig. 1. Section of Ordinary Extension Ladder.
Fig. 2. Section of Steelback Extension Ladder.

Extension ladders in two or more sections, as generally made, are fitted with automatic locking clips and ropes for extending and closing the ladder, the sections being of successively decreased width, so that the sides of each upper section fit between those of the section next below (Fig. 1). One advantage gained by this form of design is the reduction of weight, and another the avoidance of top-heaviness. But in the case of ladders in more than two lengths the top section may be inconveniently narrow, unless the width at the bottom is proportionately increased.

The Slingsby extension ladder embodies the novel principle of being constructed with a channel steel liner along the back of each upright. The liners are put on so as to give a slight camber to the ladder, which straightens under load, the steel back working in tension and the timber front in compression.

The front and back sections are of the form represented in Fig. 2, and, as both are of the same width, the extended ladder is of uniform gauge throughout, while the sections can be separated to form two independent ladders of equal width. Each extension section slides up behind the section below, and is held by spring steel clips in which the steel back slides. Consequently the friction is much less than in the case of ladders where the extension sections are moved up in front and the sliding surfaces are of wood, constituted by the sides and rungs of the two ladder sections. The Slingsby automatic locking arrangement operates without springs, and is manipulated from below by a rope.

Fig. 3 illustrates Heathman's patent ladder scaffold formed of extension ladders of extra width, with diagonal bracing bolted in position. The ladders are lashed to horizontal bars, analogous to putlogs, projecting from window openings and fixed by a jambing arrangement consisting of a tube fitted at one end with a nut in which works a screwed rod. If preferred, the ladders can be secured to eyes screwed into the joints of the brickwork. Working platforms can be formed by passing scaffold boards through the ladders to rest on the rungs at different heights, or may be supported by brackets bolted to the inner face of the ladders.

Fig. 4 represents Palmer's patent scaffold, built up of ladders with parallel sides, placed about 10 ft. apart, and 2 ft. 6 in. away from the building to be repaired or cleaned. The ladders are connected by horizontals, serving the purpose of guard rails, at intervals of 7 ft. 6 in. apart, and the whole system is braced by diagonals as shown. Brackets are fixed as indicated in the end elevation for the support of working platforms, two boards wide, at each stage between the ladders and the work, the method of securing the scaffold to the building being shown by the detail below. The braces and guard rails are made with slotted openings, so as to facilitate adjustment as necessary.

The well-known wrought-iron cripple, with quadrant and pin for adjustment, enables the builder to establish a simple type of working platform at any height within the reach of two ordinary ladders. When provided with sockets for the attachment of a guard rail, cripples lend themselves to the formation of a very convenient and safe type of temporary scaffold arranged in either of the two ways shown in Fig. 5.

An American variety of ladder scaffold, which is very popular with stucco contractors, consists of two or more specially made ladders, each fitted with steel guides in which runs a movable steel frame having brackets for the support of two platforms, one for men to stand upon and the other for tools and materials. The arrangement is represented in Fig. 6.

The ladders have rungs 12 in. apart, and placed far enough from the centre line of the sides to allow for the attachment of the guides, made of $\frac{7}{8}$-in. channel bars, and the ladders are stayed by struts attached by means of bolts passed through each side standard. The movable frame is built up mainly of light angle bars, with the exception of the sides, these consisting of $1\frac{1}{2}$-in. channel bars with the hollow side out, so as to

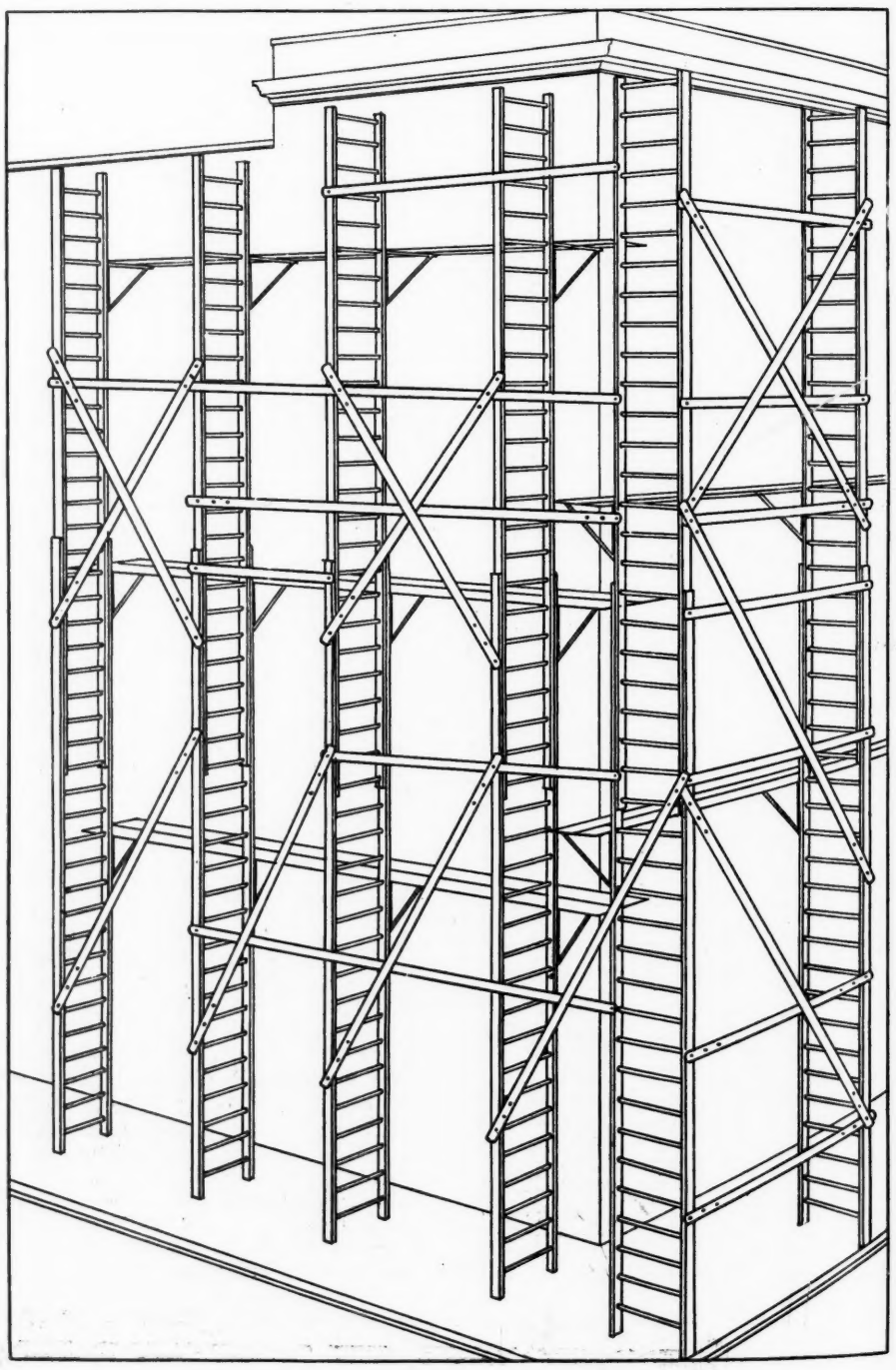


Fig. 3. Heathman's Patent Ladder Scaffold.

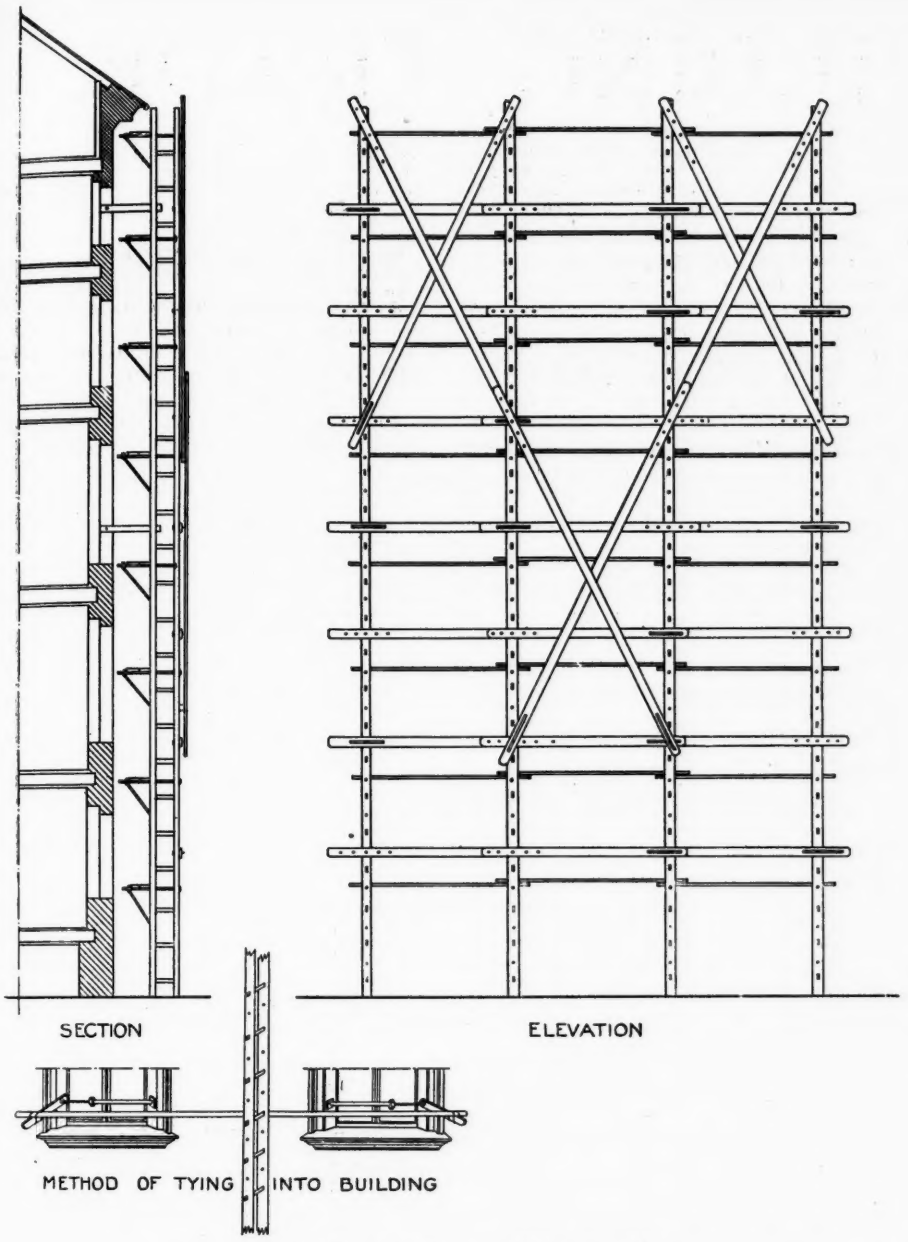


Fig. 4. Palmer's Patent Ladder Scaffold.

engage the $\frac{7}{8}$-in. guides attached to the ladder. The frame is completed by cross bars and diagonal stays, one of the former having an eye for engaging the hook of the hoisting tackle. Grips are provided which lock automatically at intervals of 12 in. apart, and the scaffold can be raised or lowered either by the men using it or from ground level. The channel guides on the ladders terminate 4 ft. above the ground, so that the movable frames can be attached or removed after the ladders have been placed in position.

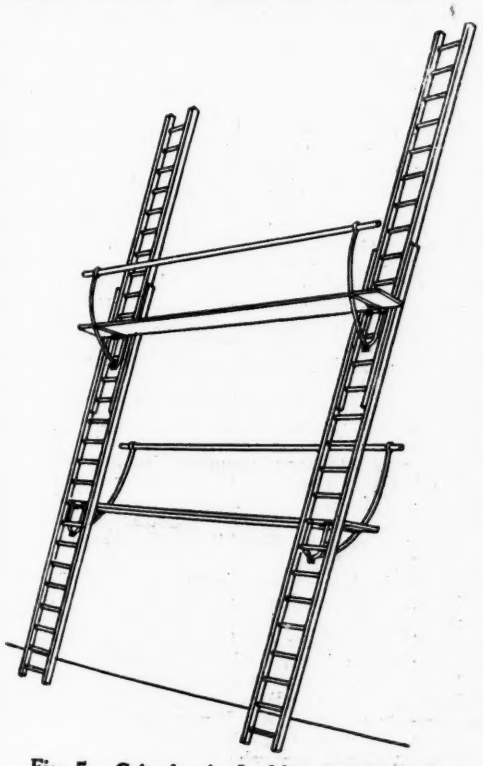


Fig. 5. Cripples in Ladder Scaffolding.

The working platform and ledge above consist of planks, of which only a short length is shown in Fig. 6, where it will be noticed that the ledge itself constitutes an effective guard rail.

A somewhat equivalent form of movable scaffold introduced into this country by Messrs. Stephens & Carter consists of a strongly built platform made in lengths up to 12 ft. complete with guard rails, and suspended from two ordinary ladders by the Kruse patent clutch arrangement. The clutches engage the ladder rungs, and when it is desired to raise the platform the workmen step from it to the ladder, turn the handles at each side, thereby releasing the clutches, and walk up the ladders carrying the platform with them. The platform is secured in its new position by allowing the handles to turn back when a spring forces the clutches over the rungs. Another cradle has been invented on the same principle, but designed for use by one man. The cradle affords protection of a kind not given by the use of ordinary ladder brackets, and provides ample room for working.

As a final illustration we give in Fig. 7 a sketch of the arrangement generally adopted to provide means of access to the top of chimney shafts in need of repair. The first ladder reared from the ground is blocked out about 9 in. from the wall, and secured by two hooks driven into the brickwork and passing over the sides of the ladder, the fixing being

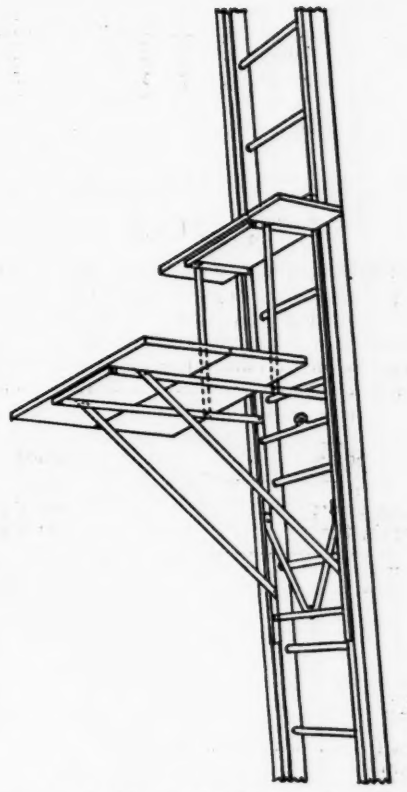


Fig. 6. Ladder with Hoisting Scaffold Bracket.

completed by lashing. Other hooks are driven at intervals, holding the sides and rungs alternately. For the purpose of hoisting the next ladder an eye bolt is driven into the wall, and through it the rope is passed, but a better plan is to use a hook from which to suspend a pulley block. One end of the rope is tied near the middle of the ladder, and lashed with cord to the top

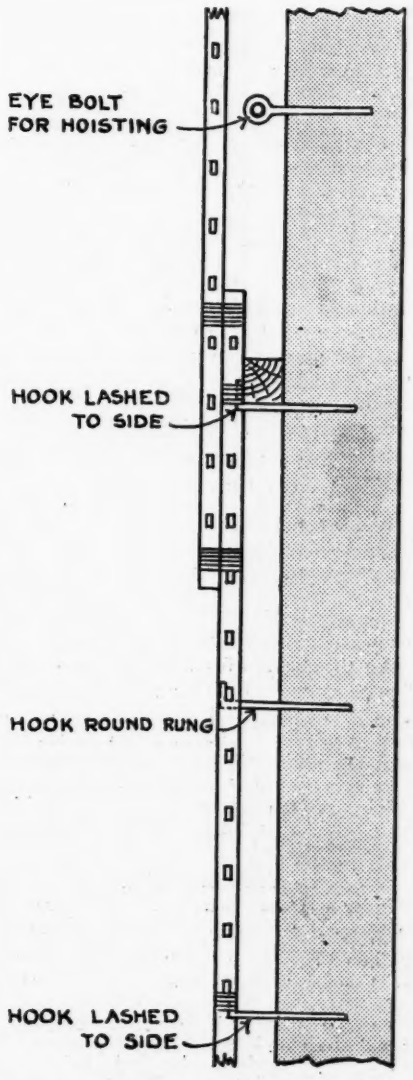


Fig. 7. Ladder Scaffold for Chimneys.

rung. When the top of the ladder has been hoisted as high as the top of the first ladder, the lashing is cut, and while one man guides the new length, other men continue to hoist until the relative position of the two ladders is suitable for their connexion by lashings around the sides, the overlap being about five rungs. The method of fixing the second and succeeding ladders is the same as that already described. The blocks of timber are sometimes replaced by iron dogs, another variation being to use ladders connected by socketed joints, and fixed by means of eye bolts driven into the wall and hooked bars secured to the ladder sides by screws or bolts. This alternative method does not afford the same degree of safety as the first mentioned, because the eye bolts and hooks do not afford direct support for the ladders, whose safety depends almost entirely upon the ability of the bottom length to sustain the load transmitted from the whole range of ladders above.

GENERAL BUILDING NEWS.

ST. MARTIN'S CHURCH, WORCESTER.

This building has been erected from the designs of Mr Geo. H. Fellowes Prynne, F.R.I.B.A., architect, of Westminster. The sculpture and carving work was carried out by Messrs. H. H. Martyn & Sons, of Cheltenham, and the electric lighting by the Nevile Engineering Company, of Worcester.

EXTENSION OF ACADEMY, AYR.

It is proposed to carry out extensive alterations at Ayr Academy, and the estimated cost is 12,000*l.* The plans are being prepared by Mr. J. A. Morris, F.R.I.B.A., architect, of Ayr.

ASSEMBLY HALL, CAMEL'S HEAD.

The cost of this building is estimated at 750*l.*, and is being erected by Messrs. Toyer & Son, contractors. The architects are Messrs. Thornely, Rooke, & Barron.

RAILWAY HOTEL, STRATHPEFFER.

This hotel has been erected for the Highland Railway Company from the designs of Messrs. Cameron & Burnett, architects, of Inverness. The various contractors for the work were:—Mason work, Messrs. William Alexander & Co., Inverness; ironwork, the Rose-street Foundry Company, Inverness; carpenter work, Messrs. D. & J. Milligan, Ayr; plumber work, Messrs. Barton & Sons, Edinburgh; asphalt work, Messrs. W. G. Walker & Sons, Edinburgh; slater work, Mr. John Reid, Inverness; plaster work, Messrs. James Scott & Son, Aberdeen; tile layers, Messrs. Robert Brown & Son, Paisley; painter work, Messrs. John Kintrea & Son, Elgin; boiler, hot-water supply, and cooking apparatus, Messrs. Henry Walker & Son, Ltd., Newcastle; electric lighting, Messrs. Osborne & Hunter, Glasgow; lifts, Messrs. A. & P. Steven, Glasgow.

NEW LIBRARY AND INSTITUTE, PENGAM.

The foundation-stones of these buildings were laid last week, and the cost of erection is 1,381*l.* Mr. D. J. Thomas, of Blackwood, is the architect for the work, and the contract is being carried out by Mr. W. Yeo.

TOWN HALL, SOUTH BANK.

Now that the local Council have received the sanction of the Local Government Board to borrow 6,400*l.*, the erection of the proposed Town Hall is to be commenced as soon as possible. The plans have been prepared by Mr. A. Farndale, architect, of Brotton.

CINEMATOGRAPH THEATRE, EDINBURGH.

This theatre has been erected on the site of some old dancing and entertainment rooms, and has an accommodation for about 600 people. The cost of the erection has been about 5,000*l.*, and the architect is Mr. H. J. Blanc, R.S.A.

FARM BUILDINGS.

The Aberdeen Lunacy Board has decided to erect at Kingseat new farmsteading, cottars' houses, and piggeries at a cost of over 3,000*l.*

TRADE NEWS.

Under the direction of Mr. Thomas Owen, architect, Tydweiliog, the "Boyle" system of ventilation (natural), embracing Boyle's latest patent "air-pump" ventilators and air inlets, has been applied to the Calvinistic Chapel, Tydweiliog.

We are informed that the name of the Patent Indented Steel Bar Company, Ltd., has been altered to the Indented Bar and Concrete Engineering Company, Ltd. The business of the firm will not be altered, but will be carried on under the new name at the same address, Queen Anne's-chambers, Westminster.

In reference to the paragraph which appeared in our last issue, p. 759, Sir Joseph Causton & Sons, Ltd., Birkbeck-street Works, Bethnal Green, write to say that they were the official contractors for direction signs for the Festival of Empire authorities, and that a large number of the direction signs for private exhibits were supplied by them and other sign manufacturers.

THE NATIONAL INSURANCE BILL.

The Glasgow Building Trade Exchange has decided to take joint action with the building trades throughout the country against the Insurance Bill.

PROJECTED NEW BUILDINGS IN THE PROVINCES.*

ACCRINGTON.—Rebuilding of portion of parish church (6,000*l.*); the Vicar.

Ashby.—Church; Vicar of Bottesford.

Aylsham (Norfolk).—Wesleyan Chapel (120 places); Mr. M. D. Howard, builder, Cawston, Norwich.

Ayr.—Alterations to academy (11,000*l.*); Mr. J. A. Morris, architect, Wellington-chambers, Ayr.

Barrow.—Meter, exhauster, and purifier houses at gas works (980*l.*); Messrs. W. Gradwell & Co., Ltd., builders, Hindpool Saw Mills, Barrow, Lancs.

Bedford.—Additions, workhouse; Mr. H. Young, architect, 35, Maitland-street, Bedford. Church (4,600*l.*); Vicar, St. Leonard's, Bedford.

Bradford.—Sanatorium buildings; Mr. W. Williamson, City Architect, Bradford.

Brentford.—Theatre, High-street; Messrs. Dorey & Co., builders, Brentford.

Brighouse.—Public baths (4,800*l.*); Mr. S. Spencer Haywood, Surveyor, Brighouse Town Council.

Burntwood.—New school and alterations and additions to existing school, Chasetown (2,640*l.*); Mr. W. Cooper, builder, West-street, Blackheath, Birmingham.

Caerleon. — Training college (28,250*l.*); Messrs. Alfred Swash & Son, architects, Newport, Mon.; Mr. F. Bond, builder, Cardiff.

Cambridge.—Buildings, Queen's College; Mr. C. G. Hare, architect, South-square, Gray's Inn, W.C.

Canterbury.—Extensions at "Woodville" (1,520*l.*); Messrs. G. Lewis & Son, builders, 14, Widred-road, Tower Hamlets, Dover.

Chatham.—Proposed school; Mr. J. Thompson, Secretary, Education Committee, Chatham Town Council.

Cleckheaton. — Business premises, Union-street, for Messrs. Alfred Hall, Ltd. Addition to Wharf Works for Messrs. P. & C. Garnet, Ltd.

Crewe.—Proposed new church; Vicar, St. Paul's Church, Crewe

Denton.—Additions to hat works, Dane Bank, for Messrs. J. Wolfenden & Co.

Derby.—Mill (3,570*l.*); Messrs. Pegg & Bailey, builders, Porter-road, Derby.

Dewsbury.—Extensions, premises of Messrs. J. Berkhead & Co., Ltd., mungo and shoddy manufacturers.

Dumfries.—Additions, infirmary (10,000*l.*); Managers of Dumfries Royal Infirmary.

Easington.—Twenty houses; Mr. J. Droxford, builder, Easington.

Edinburgh.—Pavilion, Inverleith-place, for the proprietors of the Edinburgh Academy.

Elland.—Proposed mill off Gross-lane for Messrs. Halstead, Marshall Hall Mills, Elland.

Elsenham.—Alterations at Crown Inn for Messrs. Watney, Coombe, Reid, & Co.

Everton.—Police-station, Mere-lane (9,500*l.*); Mr. J. T Alexander, City Surveyor, Liverpool Town Council.

Folkestone.—The following plans have been passed:—Motor garage, Ingle-mews, Christ Church-road, for Mr. G. T. Sharp, Mr. F. Pennel, architect, Mr. S. Binfield, builder; alterations, Guildhall Hotel, Guildhall-street, for Messrs. Mackeson & Co., Mr. G. H. Camburn, architect; alterations and additions, Pembury Lodge, Castle Hill-avenue, for Mr. S. Coxon, Messrs. Jennings & Duthoit, architects; six houses, St. Francis-road, for Messrs. Goodwright & Son, Mr. H. Videan, architect.

Gerrard's Cross.—School accommodation; Mr. W. Riley, architect, Aylesbury.

Glasgow.—Theatre; Messrs. Fyfe & Fyfe, builders, Glasgow.

Glodwick (near Oldham). — Extensions, church and school; Vicar, St. Mark's, Glodwick.

Godshill.—Buildings (2,600*l.*); Mr. S. R. Cocks, Surveyor, Isle of Wight County Council, Ryde.

Goole.—Cottage hospital (5,500*l.*); Messrs. J. Ledgard & Son, builders, Ventnor-street, Leeds.

Gosport.—School, Stone-lane; Mr. H. A. F. Smith, architect, Star-chambers, High-street, Gosport.

Halmersend. — School; Mr. Hutchings, County Architect, Stafford.

Hanley.—Premises; Messrs. H. Dain & Son, architects, Hanley; Mr. G. Ellis, builder, 52, High-street, Hanley.

Hazel Grove.—Additions to works, London-road, for the English Sewing Cotton Company.

Hempstead.—Extensions to school (2,250*l.*); Secretary, Education Committee, Gillingham Town Council.

Huddersfield.—Proposed banking premises, King-street, for the National Provincial Bank of England.

King's Dyke.—School; Mr. H. Dunn, St. Peter's Churchyard, Lincoln.

Kingstown.—Proposed public baths; Surveyor, Kingstown Urban District Council.

Kirklington.—County school; Mr. L. Maggs, architect, Shire Hall, Nottingham.

Leeds.—Extensions to Millshaw Leather Works, Churwell, for Messrs. W. L. Ingle, Ltd.

Letchworth.—Four houses (540*l.*); Messrs. Palmer & Ray, builders, Letchworth.

Lincoln.—Stage and dressing-rooms, Hungate, for the London and General Electric Theatre Company.

Linlithgow.—Building (900*l.*) for the Linlithgowshire School Board.

Llanbyther. — Congregational Chapel (1,400*l.*); Mr. W. Beddoe Rees, architect, Cardiff; Mr. Ben Jones, builder, Pencader.

Llangollen.—Enlargement of County school (4,000*l.*); the Governors.

Maidstone.—Offices for the Kent County Council (44,335*l.*); Messrs. Wallis & Son, builders, Broadmead Works, Maidstone.

Muckcroft.—Colony for epileptics (43,520*l.*); Architect, care of Surveyor, Glasgow Parish Council.

Nottingham. — Restaurant, Milton-street; Messrs. R. Evans & Son, architects, Wheelergate, Nottingham. Bank, Mansfield-road: Mr. T. Long, builder, North Church-street, Nottingham.

Peterborough. — Church hall; Messrs. Townsend & Fordham, architects, Cross-street, Peterborough.

Quarrington Hill.—Workmen's social club (1,275*l.*); Mr. Bell, builder, Ferryhill.

Ramsbottom.—Paper mill, Stubbins; Mr. John Inman, builder, Bury, Lancs.

Rugby.—Children's home (566*l.*), also new kitchens (656*l.*), etc.; Mr. C. W. Perkins, builder, Hillmorton.

Southampton.—The following plans have been passed:—Additions, Oatlands, Winchester-road, for Mr. C. Barter; fifteen houses, Newlands-avenue and Hill-lane, for Messrs. Jurd & Sanders

South Bank.—Town hall (6,400*l.*); Mr. A. Fearndale, architect, Brotton.

Shrewsbury. — Factory, Mardol; Mr. A. Williams, architect, High-street, Shrewsbury; Mr. H. Price, builder, Shrewsbury.

Sleaford.—Church (8,000*l.*); Mr. Wood, architect, Sleaford.

Sunderland.—Institute and parish hall; Vicar, St. John's Church, Sunderland.

Thatcham.—Clubroom, Chapel-street, for the South Berks Brewery Company.

Thorpe.—Nine houses; Mr. H. Beeney, Surveyor, Chertsey Rural District Council.

Tiverton — Science block at Blundell's School; Messrs. J. Grater & Sons, builders, 16, Townsend, Tiverton. School (4,950*l.*); Messrs. G. Pollard & Co., Ltd., builders, Wood-street, Taunton.

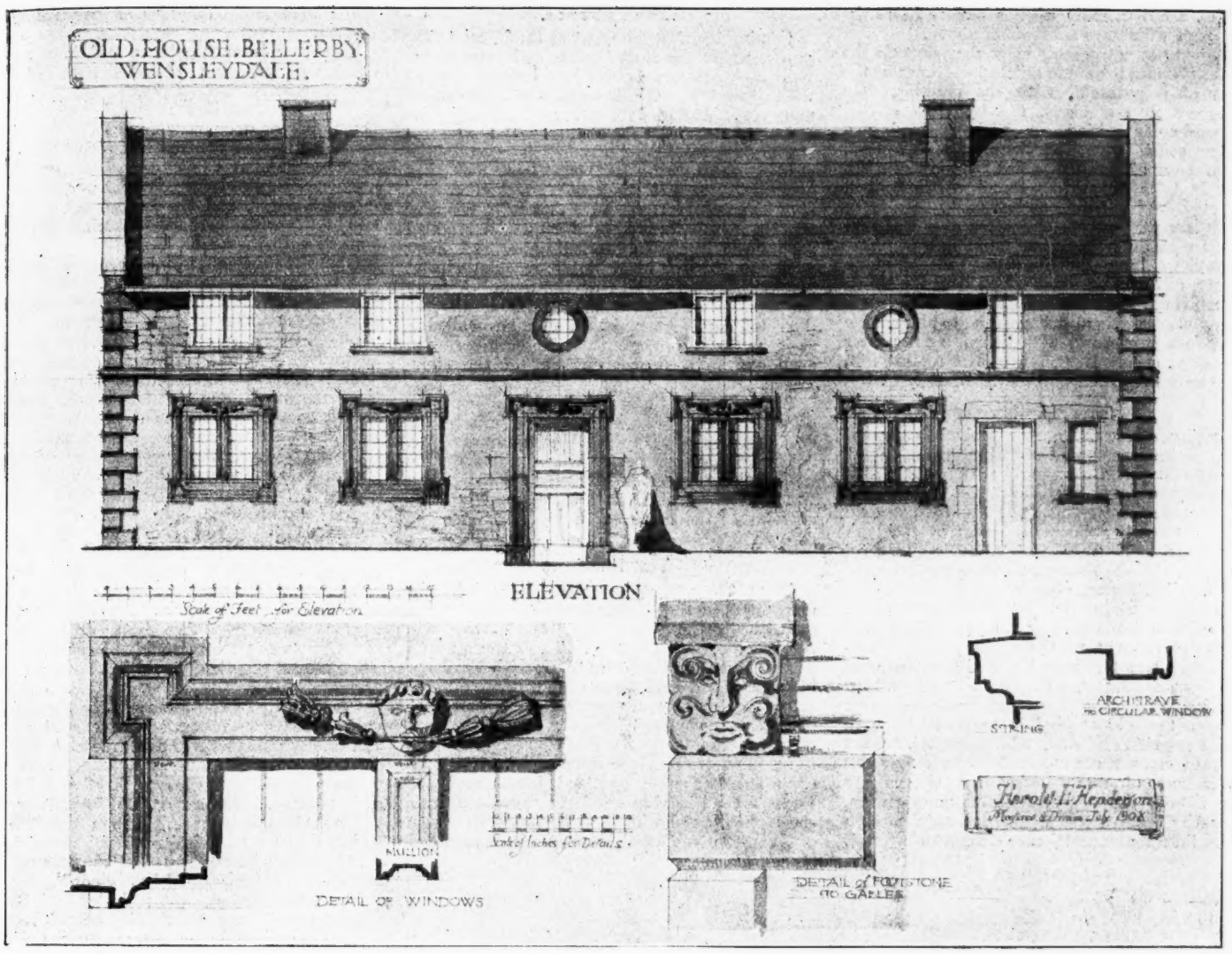
Torquay.—The following plans have been passed: — Four houses, Orchard-road, Mr. Bryant; three houses, Happaway-road, Mr. Cory; three houses, Cambridge-road, Mr. W. Adams; additions, "Loreto," Livermead, Mr. F. Penwill.

Walsall.—Electric sub-station at Bloxwich; Messrs. W. Kendrick & Sons, builders. The following plans have been passed:—Alterations and additions, premises, Neale-street, for the Walsall Locks and Cart Gear Company, Ltd.; infants' school, Glebe-street, for the Governors of St. Mary's Schools; extensions, Old "Saracen's Head," Stafford-street, for Mr. H. B. Harris.

Warrington.—Plans have been passed as follows:—Extension to mission, Kent-street, Mr. A. Wright; branch shop, Padgate-lane, for the Warrington E.I. Co-operative Society, Ltd.; seven houses, Pinewood-avenue, Mr. P. Lawton; additions, works, Sixpenny-lane, for Messrs. Rylands Bros., Ltd.; twelve houses, Cross-street, Mr. W. Rowlands; ten houses, Cross-street, Mr. Jas. Thorniley.

West End.—Church; Vicar, St. David's, Dundee.

* See also our list of Competitions, Contracts, etc., on another page.



MINOR DOMESTIC ARCHITECTURE OF YORKSHIRE.

THIS was the title of a paper by Mr. Harold E. Henderson read before the Leeds and Yorkshire Architectural Society on February 23. In the course of his address Mr. Henderson said:—

"Amongst the hills and dales of Yorkshire, chiefly in the West and North Ridings you will find villages and hamlets so quiet and peaceful that one may say the hand of Time seems to stand still. The houses are sturdy and strong, and stand four square to the weather, perhaps in some cases grim and stern; and so, as it was with the house, so it is with the race who lived there generation after generation, fierce, stern, and strict. Puritanical and severe, but with a quaint dry wit as a tonic and saving grace.

Try for a few moments to picture such a village on a still, September afternoon: its long straggling street winding down the slope of a hill to the river. The streets are almost deserted; there is no sound but the click of the reaper in the garth below or the droning of the children in the school repeating their multiplication table. On each side, down the village street are the old stone houses with their gables and grey stone roofs, their mullioned windows and leaded panes. Some of these stand back from the street in little, brilliant gardens raised some few feet above the level of the road, and bordered with quaint cut yew and box-tree hedges. The old village inn, with its painted sign, the Blue Boar or Red Lion, or some crest or scutcheon of the old families: the Cliffords, Nevilles, Percys, or Scropes. Near the inn, across the village green, past the tall maypole, is the grey, ivy-covered church and quiet churchyard, with funereal yew and willow, carved tombstone and quaint epitaph. Then farther down, perhaps, is a group of almshouses, the village stocks, then more houses, and the village ends, and we are at the bottom of the hill amongst the cornfields by the river.

You will note from the dates which are characteristically affixed on some part of the houses that they are nearly all of the XVIIth or early XVIIIth century. This is accounted for by the great number of landed gentry in the county at this period, and that they mostly depended for their livelihood on the produce of the land.

These people naturally encouraged building both amongst themselves and their dependents, and no doubt their example helped to form the taste of the local craftsmen.

This state of things existed up to the reign of Queen Anne, when the trade of the country rapidly developed, and the county gentleman migrated to the cities and towns.

The majority of the buildings of a domestic character in the Yorkshire dales are thus seen to be of the XVIIth century, and frequently, indeed, villages are to be found with scarce a single house of later date.

There was in this district at that time a characteristic style or manner of building quite as distinct and accentuated in its detail as any of the better-known periods of mediæval times, though naturally influenced by the Perpendicular feeling of the preceding century. It is in these Yorkshire homesteads that one will find, probably to a greater extent than any other district in England, the impress of the individual, the sturdiness and unbending character of the man, in the high, unbroken walls of his house, his taciturnity in the omission of exuberant ornament, and his piquant humour in the occasional grotesque, quaint finial, or peculiar detail on the lintol of his entrance doorway.

The West Yorkshire House.

It is not easy to describe the individual charm each house possesses from the deep-browed doorways to the quaint horsing steps, from the gabled roof and sturdy walls of the house to the roomy outbuildings behind the barns, laithes, mistals. Each house is different though one cannot say where the difference occurs, probably the reason is they are each a part of that particular plot of ground on which they stand, part in fact of the very earth.

I will describe a typical example of a Yorkshire manor-house, such a one as Oakwell Hall, Swinsty Hall in Wharfedale, or Bearpark in Wensleydale. Entering from a by-lane, one passes through a white-painted wooden gate with curved top and square spindle balusters hung to a pair of stout solid-looking stone piers, with moulded cap and base and ball terminals, or occasionally with a leaden figure or animal. Going up a few broad stone steps, you reach the level of the garden in front, with a narrow paved stone pathway leading straight up to the welcoming portal. On each side is a smooth grass lawn with a green velvet surface, to be acquired only by age. Set in the grass are clipped yews, golden or dark green, cut to geometrical and fantastic shapes, here a quaint bird with a large spreading tail or some twisted monstrosity suggesting some prehistoric monster. The pyramids, cones, squares all cut out of growing yew.

Then the old-fashioned herbaceous border, a gorgeous blaze of colour, made more vivid because of the dark yew hedge behind. Here you will find such old-world flowers as the tall foxglove, the golden sunflower, primulas, wallflowers, hollyhocks, each in clumps, giving bright splashes of reds, whites, blues, yellows, and gold.

Then the house itself, with its grey gables and open porch standing out from the general wall face, the grim blackness of the millstone grit of which it is built relieved by the long, low mullioned windows recessed in thick walls, and the play of light reflected upon the irregularities of the thickly-leaded glazing, with occasionally a fragment of painted glass, or quarries with quaint, impossible birds and beasts, and plants and flowers which one might think were culled from some old herbal.

Here and there the ivy may have managed to climb up to the level of the first-floor windows, then given up the attempt and devoted its energy to thickening its stem and developing great masses of hanging, tangled foliage and green berries.

The Influence of Site.

These houses were not usually built by the main road, or shouting from the hill-top, but sheltered from the prevailing winds, and modestly hidden from view. You will note in nearly all examples how cleverly they appear to be parts of the landscape, how advantage is taken of the fall in the ground, and the lines of the roofs and general composition of the gables seem to harmonise with the contours of the immediate hillocks and hollows. This is a point which should be specially studied by students of domestic architecture; and only those who have had practical experience in the setting of a house know how difficult of attainment is this object, and how it alters a design that is only drawn and designed on paper.

A long low ridge meets the eye, broken only by the chimney stalks of many clustered

shafts, set diagonally upon a square base, the angles of which are splayed off above.

Peeping over the main ridge may be seen the quaintly-moulded stone finials sometimes in the form of a pyramid, with the angles rudely fashioned into crockets, the last link of the Perpendicular period, or perhaps having a centre shaft, with four-square angle posts, reminiscent of the hour glass. Good examples of this type are to be found at Tong and Guiseley. The form and variety of these finials are very great, and often you will find they are all different in one building.

Then we have the great expanse of stone slating, or thacking, as it is called in the Yorkshire dialect, graduating in size from eaves to ridge, weathered a grimy velvet black, the interstices overgrown with lichens and, nearer the eaves, where the pitch of the roof is flat, there may be golden patches of stone crop.

The Garden.

Passing through a low-arched gateway, which is in the old wall abutting on the house, we come to the kitchen-garden, the rose garden towards the south-west, and the orchard, all intersected with straight flagged paths bordered with low cut-box borders. Here in the herb corner are to be found beds of camomile, sage, lavender, the old York and Lancaster roses, the maiden's blush rose, and bushes of sweet briar. A square stone-walled bower or summer-house, with hipped stone roof or curved lead forms a delightful adjunct to the garden, such a one as that at Nun Monkton Hall, with cast leaden roof, leaded glazing, with stained and painted quarries, one calls to mind with pleasure. Many a fine old sundial is to be found with quaint gnomen and dial, with pithy motto, set generally upon a stone-paved platform.

Windows of many sizes and shapes are everywhere; deep, projecting chimney-stacks, suggesting cosy single nooks, tall stacks, high gables form a composition of delightful interest.

The Entrance.

Coming back to the front of the house to the porch, where the honeysuckle and jasmine vie with each other, we enter into its cool shadow with its white-washed walls and stone seats—more often used now for airing the milking pails or butter-plats than for resting.

The outer arch to the porch is open to the garden, there being but one door, and that opening direct into the house, which, however, is of sufficient strength to withstand a vigorous assault, being formed of oak planks studded with large iron stud-headed nails, and hung with wrought-iron band hinges, reaching almost across the whole width of the door. A large ring-handle engages a snick and secures the door by day. At night an oak bar called a stang is fixed horizontally inside the door, with each end in a pocket cut out of the stone jambs.

The ceiling of the porch is of oak beams or of plaster with an ornamental pattern in the centre generally with some heraldic quartering.

The door opens directly into a wide vestibule with stone floor and delicately colour-washed walls. This vestibule is the development of the corridor of the mediæval house known as the screens.

The Interior.

From the vestibule a door leads into the chief room of the house, the hall or houseplace called up to the present day "the House," the living-room of the family. The external wall of this room is almost taken up with the large long mullioned and transomed window divided into three or four lights in height, and subdivided by means of leaded cames into hundreds of panes of glass. At the other end of the room farthest from the door will be the large open fireplace with moulded jambs and the Tudor arched head in one large stone, and over the stone mantel will often be found the arms of the owner modelled in plaster in a moulded panel with foliated border of conventionalised flowers.

The floor is of flagstones laid in square or lozenge pattern, and rubbed smooth and clean and covered in part by rugs.

A rich brown oak panelled wainscot, the height of the door, runs round the room, and forms a pleasant contrast with the lime-white of the walls above.

The ceiling has large oak beams showing with moulded edges, and the joists resting in them laid flat, with perhaps chamfers on them worked with the adze.

Opposite the window, in a corner of the room, is a square recess in which the solid oak stair is arranged, with its beautiful balustrade formed of thick moulded strings, heavy turned and moulded balusters, and stout handrail finishing against wide newels with quaint terminals.

Oak was the material used throughout for the carpenter's and joiner's work, and the sound condition of much of the furniture testifies to the splendid workmanship.

In the centre of the houseplace would be the long, heavy dining-table with solid-looking chairs and stools, and a chair with high back at the head of the table for the master.

Around the walls a few oak Yorkshire pattern chairs just sufficiently carved to enrich without causing discomfort. Upon one side of the fireplace would be the long settle with high back and capacious box-seat and shaped arms forming a cosy corner free from draughts; or, perhaps two settles would be used, which, when moved together, would form a small, ingle nook.

On one side of the room will be the dresser, with a central cupboard with carved panels, and on each side four or five drawers with solid brass drop handles.

Near the living room will be the still room and buttery, and, across the vestibule, the parlour, a bright, sunny room panelled in white, or with light green stiles and rails and white filling, with ribbed ceiling in white plaster, and deep diamond-paned bay window.

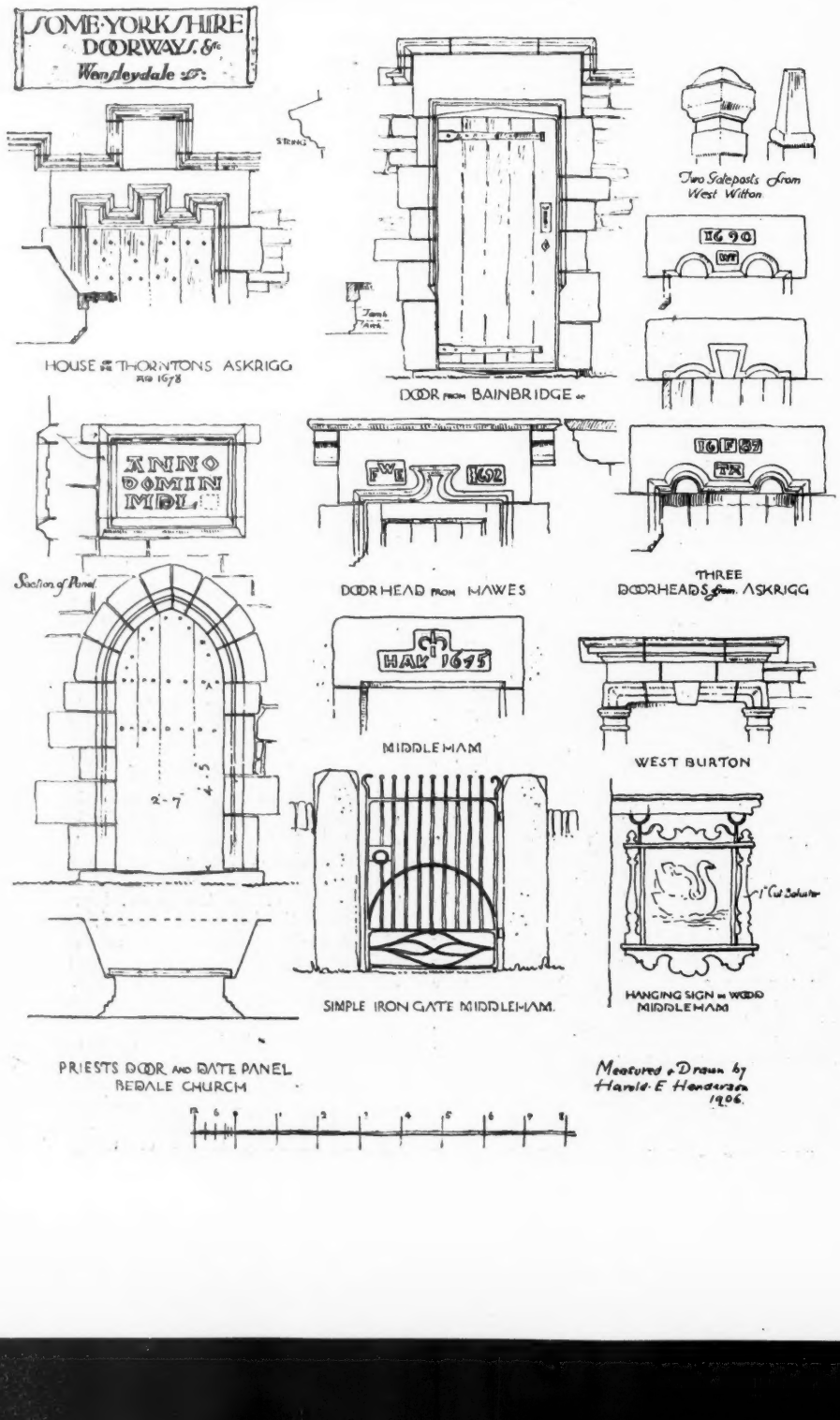
The bedrooms are large and airy with lattice windows and clean sweet scent of clean linen, and a flavour subtle and no way to be imitated which comes from old oak panels, and lavender and beeswax rubbed into shining floors, and that quiet daintiness which marked the presence of the old-world gentlewoman.

The Plan and Details.

The development of the plan is too archæological to discuss to-night, and has not much practical interest except as regards the influence on the external treatment. Plans may be divided into three types for the smaller domestic work of the county. The single bay, the double bay, and the triple bay. In the first heading all the smaller yeomen's houses can be classed under, such as Cragg Hall, Fewston, a simple spanned house with a projecting porch at one end, Countersett Hall, an interesting house of late XVIIth century date, in Wensleydale, with a projecting porch a little to the left of the centre line.

The simpler houses have, to my mind, a charm that the larger houses do not possess; absolute simplicity in outline, with an interesting projecting porch with gable and finials, and the windows of varied sizes, all speaking to the passer-by of the use of the room behind. The large mullioned and transomed window of the hall or houseplace, the smaller windows of the minor rooms, the simple projecting bay of the parlour, and single light of the dairy form an ideal composition for a small house.

The double bay plan, such as Swinsty Hall, Tong Hall, Driglington, form another type of good grouping, and the larger triple bay plan of such houses as Oakwell Hall complete the list, coming under the heading of "Minor architecture." We will now analyse a few of the items that make these delightful compositions. Perhaps the most striking and distinctive feature of the style is the window. It is a feature that is very elastic, and can be pulled out horizontally or vertically without damaging in any way its character. It may consist of a single light or a dozen, and can be fitted to any use: small room or large hall, dairy or bedroom. We make a very great mistake, when we design this kind of window, in making the lights too wide; the usual practice is 1 ft. 10 in. wide, which is considerably too wide. The old windows measure from a foot to, at most, 18 in. in width, and if more light is required the size of the window should be increased. Another fault is we make the transom too high—5 ft. 6 in. to 5 ft. 9 in. from the floor to the underside of



the transom is ample, and it is a very tall man whose eye-level is 5 ft. 6 in. high. Too great a height in the lower windows is bad; it destroys the proportion between the lower light and the upper one. And another practical objection is the iron casements in the lower light, if too high, become strained in time, and do not fit—4 ft. is really a maximum size for a casement.

The mullions are from 5 in. to 6 in. wide over all, and in places where an appearance of strength is required 6½ in. is better. A double order in the jambs give a character and strength to the window impossible to obtain where the glass is only 4 in. or 5 in. from the wall surface, as in a single order window. An ideal dimension for a mullioned window is the lights to be 16 in. wide, mullions 5½ in., depth from wall face to glass surface 8 in., depth of outer order 2½ in., height of lower light 3 ft., and the upper light 2 ft. 3 in., thus obtaining four panes in the lower and three panes in the upper.

Mullions may be splayed or slightly (very slightly) hollow or ovolo in section, the square fillets never less than 1⅛ in. A quaint little touch may be obtained by leaving square blocks of stone at the mitres of the mullions and transoms, this conceit may be seen at Oakwell Hall.

Head stones 9 in. deep are sufficient, but where no hood mould is proposed they may vary in size if more than one stone in length is required; this you will find in dozens of cases, it takes away the hard level line. You will see it in the work of Mr. Lutzens; the same idea may be applied to the sills.

Jamb stones should have plenty of tail into the wall, and the plan of cutting down cubical stone here is a great mistake. Each stone should be shown on your details, as a lot depends on the proper bounding and the nice line you can obtain, and hood moulds are generally made too small, 5 in. deep should be a minimum, 3 in. deep is mean. Another point to remember is the mitred and returned end to the hoods and strings; the old men always treated these little points in an effective manner. Sometimes only mitred and returned, others with a deep vertical return; sometimes with two mitres, and again some quaint little shield or scroll.

A word or two regarding the glazing would not be amiss. Plain oblong glazing looks the best. A good proportion of pane is to take the width of the pane (determined, of course, by the width of the light) project this width vertically, then take the diagonal, and when projected vertically, it will give you the desired height. A pane too squat is bad, as is the pane too elongated. Simple lozenge-shaped panes can be effectively worked provided you don't get them too long; the shape of the ace of diamonds found in old playing cards, is good. A proportion of 5 to 3 will work admirably. Pattern glazing should be used with care, and the simpler the better. The octagon and dot, and the roundel are good, anything in the shape of the vicious curves of L' Art Nouveau should never be introduced. Lead cames should never be less than a full ½ in. wide, and a practical point to be remembered is to get a good rounded section with a very thick web, and see that the joints are well soldered. Saddle bars ¾ in. look well, and should be introduced as part of the design. A little stained glass may be introduced if of very good design and colour. Public-house cheap glazing is better omitted.

The Walling.

The type of walling in a Yorkshire house is a great factor in its design. A paper could very well be devoted to this subject. The two classes of stone used in Yorkshire—the sandstone and limestone, each require an absolute different treatment.

Great care must be taken not to get the dressings too finely worked. A too great contrast between the walling and the dressings is never found in the best examples, and the modern method of rough parpoint pitch-faced walling with drafted angles and finely-rubbed dressings is to be deplored, it has too much of the machine about it to be pleasant.

Limestone walling permits of finer detail in the finishings. Again, there are various methods to be used suited to the different types of stone. The limestone walling of York and Tadcaster is in large stones generally built in courses with a rather finely dragged surface.

The limestone of the dales is in small stones always in courses with wide joints rather rough on face. Splendid examples of this type are to be found in the district around Settle. One specially delightful cottage at Austwich is built in equal courses of stones 7 in. deep and about 10 in. long, and at the eaves are two courses of thin sandstone. The walling is grey-white in colour, the eaves stones are greenish-brown, and the slating a dark greenish grey, a beautiful example of simple colouring.

The Roof.

The roofs of the stone slates homesteads are comparatively of a flat pitch owing to the large slates used to cover them.

As a rule, you will find the slates graduate in size from the eaves to the ridge; there is no doubt as to the æsthetic value of this arrangement. They vary in thickness from 1 in. to 1½ in. in some cases.

The joints of the old slate roofs were pointed with a species of moss obtained from the waste land bogs, this was well padded into the joints and under the head of the slates, and in a short time the moss developed and filled all interstices, a much better way than the modern method of pointing in lime, which works loose very quickly even when well incorporated with hair.

Lead being difficult and expensive to obtain, valleys were constructed in stone, generally a saddle back ridge was turned upside down, and the slates projected over the edges, and in the case of the smaller slates they were swept round in a curve in the same way the Colleyweston slating is done.

Thatch was used a great deal, good rye straw was the best material, tied with ling fibre to the rounded saplings used as rafters, and well pegged down. A thick layer was placed in the ridge and pegged and laced down, the eaves projected about 18 in., and the thatch cut clean at right angles with the surface of wallings.

Doorways.

The earlier doorways directly following the Perpendicular period had either elliptical door heads with separate arch stones, as at Swinsty Hall, or were in one large stone with a flat-pointed soffit.

Jambs were moulded generally with two moulds with a fillet between; the outer mould ran up to the head and returned across square, the inner mould followed the shape of the soffit, and the spandrils formed by this arrangement were filled with either a sunk eye or with carving.

Gables.

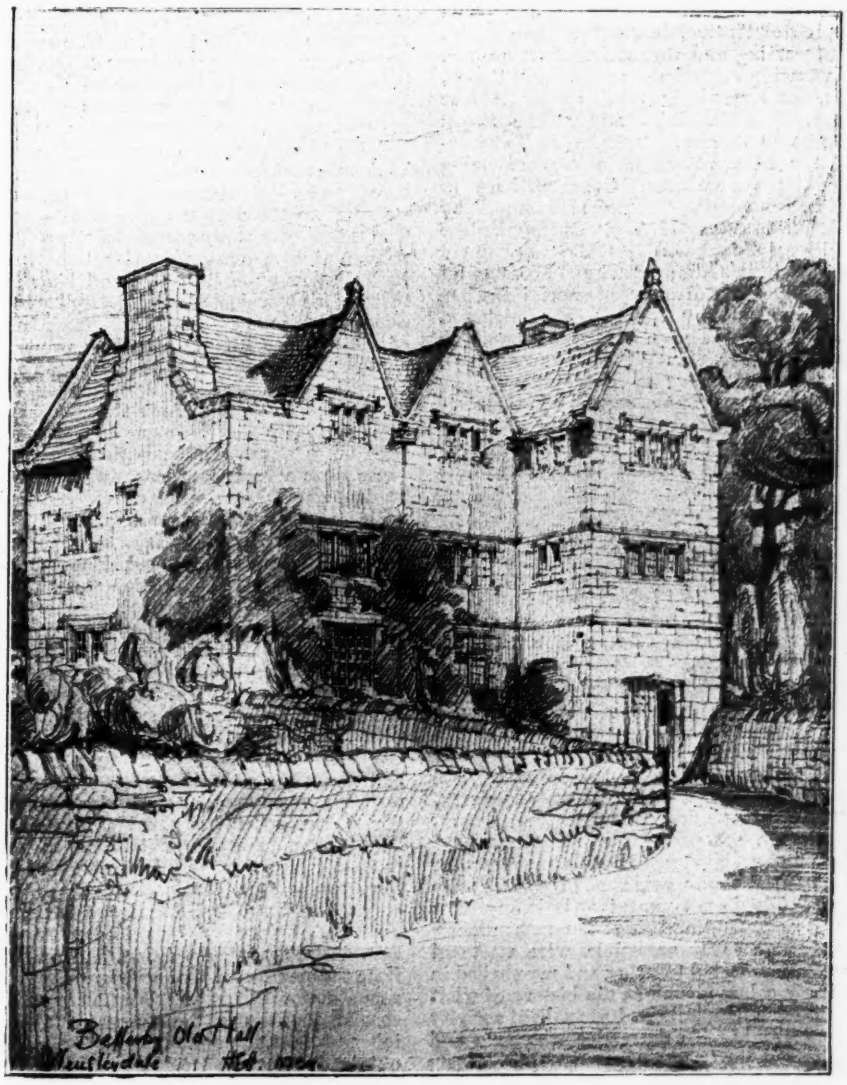
Gables naturally followed the slope of the roofs, and were generally from a foot to 18 in. above the level of the slates. The details of the copings show the gradual development from the Perpendicular period to the classic types of the XVIIIth century. The weathered and roll coping of the early periods are to be found at Guiseley, Burmsall Grusington; then the hollow or cyma mould, and gradually the filleted fascia developed. The apex had usually a finial termination, and here and at the feet of the gables the village mason let his fancy roam a little, and dozens of quaint and curious examples are to be found, some more curious than beautiful. The hour glass, the ball terminal, pyramid gablet, and crocketted or voluted pinnacle, are amongst the most common specimens. The corbel at the foot of the gable is another little feature generally treated in a clever manner; and unique examples are to be found at Grinton and Swaledale, Thorolby, Guyle, etc. In the middle of the gable you will often find a little window which gives a valuable note in the composition, often oval in shape, with sunk spandrils as at West Witton, triangular or circular, sometimes just a slit with a quaintly cusped head.

Eaves.

Eaves were originally without any gutters, the rafters showing sometimes shaped but generally left free from the tool. Occasionally corbel courses are found with gargoyles at the bottom of the valleys, as at Swinsty, in the earlier examples parapets with gutters behind are to be seen, as at Bellerby in Wensleydale, but the scarcity of lead soon made the village builder give up using this rather fine feature.

Chimneys and Fireplaces.

Chimney stacks are in the great majority built square or oblong in plan, with a square base and wide projecting weathering, following the rake of the roof built with the stack. Early examples, as at Bolton and Masham, have moulded and battlemented copings, later cappings are made up of a bead necking, and a simple cavetto, ovolo, or cyma mould with fillets. Circular chimney shafts in stone are to be found in Swaledale and at Rigton, near Harrogate. The stacks were generally built of ashlar in



slabs from 5 in. to 7 in. thick, but, where ashlar was difficult to obtain, they were built up of rubble or thin laminated stone, and finished with a thick rough-edged stone slate cap.

A very common form of chimney stack is the large projecting chimney built up from the ground, and with their ample dimension suggest cosy ingle nooks inside.

The early fireplaces were formed by a wide arch covering a recess about 7 ft. wide by 3 ft. deep, with very often a raised hearth. Some very interesting stone fireplaces of the early part of the XVIth century have been found during the restoration of St. William's College.

An early example of XIVth century date is to be seen in the old Hall at Preston in Wensleydale; later examples have moulded jambs and heads designed and constructed in a similar manner to the entrance doors.

Later came the basket grate and hob, of which dozens remain. Wide ingle nooks are a feature to be found in nearly every house, their dimensions compare very favourably with the modern types of ingle nooks, which are generally formed by wooden screens, and are a bit of imitation half-timber work over.

BOOKS.

Memorials of Old Surrey. Edited by the Rev. J. CHARLES COX, LL.D., F.S.A. Illustrated with thirty-five plates and forty-two line drawings. Demy 8vo. (London: George Allen & Sons, Ruskin House, Rathbone-place. 15s. net.)

NO BETTER choice could have been made in selecting Dr. Cox as the editor of the Surrey volume of this excellent series of the memorials of the counties of England, the general editor of which is the Rev. P. H. Ditchfield, M.A., F.S.A. Dr. Cox is a well-known antiquary and topographical writer, and the articles which have been contributed by him and others are of an original character and by writers of an established reputation. The volume is particularly rich in interesting articles, and it would be valuable if only for the contribution by Mr. P. M. Johnston, F.R.I.B.A., F.S.A., on "The Wall-Paintings in Surrey Churches," with drawings by the author, including the famous Chaldon painting, "The Ladder of Salvation and the Torments of Hell." The article is descriptive, but the author makes some interesting and suggestive observations. Other valuable contributions are on "Roods, Screens, and Lofts in Surrey," by Mr. Aymer Vallance, M.A., F.S.A., and "The Royal Residences in Surrey," by Mr. J. Tavenor-Perry, the illustrations in each case being supplied by the authors. Other articles in the volume include:—"Historic Surrey," by Mr. H. E. Malden, M.A.; "Surrey Before the Norman Conquest," by Mr. G. Clinch, F.S.A.Scot., F.G.S.; "The Forests of Surrey," by the Editor; "Memorial Brasses in the County," by Mr. F. R. Fairbank, M.D., F.S.A.; "The Fortunes of Lambeth Palace," by Mr. S. W. Kershaw, M.A., F.S.A.; "The Abbey of Bermondsey," by Mr. Fairbank; "The Abbeys of Chertsey and Waverley," by the Editor; and "The Post-Reformation Foundations in Surrey," by Mr. Malden. The volume is an admirable addition to the series.

Colour Printing and Colour Printers. By ROBERT M. BURCH. With a chapter on "Modern Processes" by W. Gamble. Pp. 275, with an excellent index. Eight half-tone illustrations and twenty-three in colour. (London: Sir Isaac Pitman & Sons, Ltd. 1910. 12s 6d. net.)

IT is a pleasure to the reviewer to come upon a book which he may praise almost without reserve, though with a soberness and moderation which consorts with the author's subject and method, and is not due to the desire to deal charitably, overcoming a temptation to condemn. Mr. Burch has produced a technical history, which though not exhaustive, for that would require a library, is yet sufficient—at any rate, for our taste—and shows evidence of considerable research. We do not remember in it any facts which are startling and new, but rather many which, though easily accessible, were scattered and are here gathered together and marshalled in the narrow column, such as the history of what is in our day a definitely and specialised activity always presents. To determine who may and who may not justly be put upon your roll is no easy thing, and so in this matter of colour printing; while in modern times the way is fairly clearly defined, in earlier days the author's task becomes more difficult. Without questioning the ruling fact that printing of any sort implies reproduction, one may say that the whole scope and aim of colour printing has changed, and if we would cavil with our author it would be on the ground that he seems to be unconscious of this. Though even here we are inclined to think that the reviewer should be grateful to the writer, who, being immersed in the details and immediacies of his subject, leaves the philosophic crux for him, the reviewer, to explain in terms of that larger outlook which should be his chief qualification for his task.

The volume before us is a plain and sensible book. Being written in English it is written from the English point of view, and any necessary reference to Continental work, and there are inevitably many, is treated as an excuse, and one, the necessity of which it is hinted, all true patriots will deplore. The book does not, as two hundred years ago it almost certainly would have done, begin in chaos, and endeavour to assign the invention of the craft to the Deity, Moses, or Alfred the Great; neither does the author do more than touch upon, to show that he is aware of this, the earliest, though separate origin in the Far East, or Cicero's reference to the *benignissimum Varronis inventum* by which pictures were reproduced, though how exactly we do not know. There are other partially or wholly fabulous tales and manuscripts of whose handiwork there is some doubt. But these things very properly do not concern us. Printing begins with Gutenburg.

At first colour printing consists merely of the use of coloured ink—red usually—instead of black or ordinary type, and the unsuccessful attempts to rival the illuminator who was still employed even on printed books. But colour printing proper, as we now understand it, the reproduction of coloured pictures, does not come to pass till between 1500-50 with the *chiaroscuro* printers, Parmegiano, Ugo da Carpi, the Cranachs, and the wonderful Altdorfer. With these men it was an art, just as the engraving and etching was; an art by which effects could be produced which could be attained in no other way. Doubtless they thought little of this aspect; were in all probability engrossed in endeavours to turn out a lot of pictures. There was no need for them, as for us, to ponder the ethics of their method and pursue it self-consciously. The mechanical way of doing a thing was never distressing, was indeed attractive to ingenious minds until the XIXth century, when machines became the masters, rather than the servants, of man.

After these men there is a considerable gap. Wonderful almanacks, advancing little, continued to be the chief exemplars of the art until we come to the central figure of all—Le Blon. The story of the career of this very pushful person, at first on the Continent (he was born in Frankfort-on-Main, 1667), and later and for most of his working life in England, is too complicated for compression here. From the point of view of the history of colour printing, the central fact is that he applied Newton's theory of primary colours. At first Newton thought there were seven, and Hook thought there were two, and later Newton came to the conclusion that there were for all practical purposes but three basic colour sensations, and he fixed them as Prussian blue, yellow ochre, and red lake with an admixture of carmine. These precise colours do not hold to-day, but the essential fact that there are three, red, blue, and yellow, is known and used. Le Blon was the first to use it. As he had no photographic methods such as we have to-day for disentangling the colour elements to obtain his tones and values, he employed mezzotint for the groundwork of his pictures, and thus straightaway found a half-tone three-colour process, which in essentials has only recently been superseded. Other names, Baxter, Owen Jones, Humphreys, and Vizetelly, to mention a few of the more outstanding, occur in quick succession in the history of the development of this idea combined with lithographic processes, but it is not until the early fifties with the invention of photo-lithography that elimination of the personal element and the individual eye is seen to be possible. Colour printers to-day regard this as a desirable consummation, and undoubtedly from the standpoint of one who requires accurate reproduction this is so. We no longer look for special qualities in the colour print—qualities inherent in the process, and only by it to be obtained, unless we are dealing with the work of one of those who, like Fritz Thaulau, for instance, consciously work to obtain them. It is but one more example of what was once a highly skilled craft at least, becoming but a scientific process. The transition is not yet complete. In the authoritative chapter on modern processes by Mr. W. Gamble, what he says of the many half-tone processes shows that much still depends on the artistic skill of the operator. But there can be no doubt that the aim is to eliminate that uncertainty and leave all to the "machine."

Lives of the British Sculptors. By E. Beresford Chancellor. (Chapman & Hall. 12s. 6d.)

A VAST amount of useful information is given in this book, and many suggestions for the association of the sculptor with the architect will be found. The early allusion by the author to "pearls of sculpture" enshrined in the "oysters of brick or stone" prepares us for a popularly-written treatise. The volume is mainly biographical and anecdotal, but is no less interesting on that account. Beginning with the unknown men who went by the name, not of sculptors, but of carvers, marblers, or stonecutters, Mr. Chancellor finishes with the life and work of Chantrey. Although the main work is devoted to British artists, room is found for some foreigners who worked in England, among whom was Torrigiano, who not only achieved fame by breaking Michelangelo's nose, but by producing the statue of the Countess of Richmond in Westminster Abbey, and other works in England for Henry VIII. Nicholas Stone, born in 1586, near Exeter, the son of a quarryman, had a large practice as a sculptor, and made his mark also as an architect. In the latter capacity he worked for Lord Danby, building Cornbury in 1631, and, for the Countess of Arundle, Tart Hall, which stood to the south of the present Buckingham Palace. He was "Master Mason to his Majesty" (Charles I.). Hubert le Sœur, who created the famous brass statue of Charles I., and Caius Gabriel Cibber, father to Colley Cibber, the dramatist, are given places in the book, though they were foreigners. Francis Bird was engaged on the embellishment of St. Paul's Cathedral through the influence of Wren. Nollekens, born in Soho, in 1737, became a Royal Academician in 1772 and made a fortune (partly through dealing) of over 200,000*l.*, which was 50,000*l.* over the sum left by the industrious and successful Chantrey, who died in 1841.

Cliff Castles and Cave Dwellings of Europe. By the Rev. S. BARING-GOULD. (Seeley. 12s. 6d.)

NO TOWN-PLANNING schemes harassed the architects, if there were any, in the days of the cave-dwellers, though it is evident from Mr. Baring-Gould's book that some expert architectural advice would have been advantageous. Primitive arrangements sufficed, however, and in modern times there have been many people who have found civilisation irksome, and have retired to the caves where their ancestors lived. The emancipation of humanity from the freedom of life in the caves took many centuries, and no more stimulating antiquarian pursuit can be imagined than the reconstruction of life under the old conditions. A high degree of craftsmanship was reached by the people who fashioned ornaments, carved images, made various utensils, and in other ways introduced art into their lives; while the coins of every period afford an inexhaustible mine of historical wealth.

During the exploration of Wookey Hole, Somerset, a few months ago, coins were found ranging from Vespasian to Valentinian II. The neighbourhood of Nottingham has been the scene of many valuable discoveries. Mr. Baring-Gould has much to say concerning pre-historic man and his ways in England and on the Continent, and his book, with its numerous illustrations, is full of interest.

ST. JOHN'S, EDMONTON.

An appeal is made for funds to erect and equip a mission hall and vicarage at Edmonton in connexion with the Church of St. John's, which was built in 1906 from the designs of Mr. C. H. B. Quennell, F.R.I.B.A. It is intended that the hall shall accommodate 500 children, giving infants a large separate room and providing classrooms. Donations may be sent to the Rev. A. R. Adams, 174, Dyson's-road, Upper Edmonton, N.

METROPOLITAN ASYLUMS BOARD.

AT the fortnightly sitting of this Board on Saturday the following matters were dealt with:—

North-Western Hospital. — The Hospitals Committee submitted plans by Mr. T. W. Aldwinckle, architect, for the conversion, at an estimated cost of 2,800*l.*, of two wards of one pavilion at the North-Western Hospital into forty isolation chambers, and it was agreed that, subject to the sanction of the Local Government Board, the work should be carried out.

Belmont Workhouse. — It was resolved to approve of plans for alterations and additions at the Belmont Workhouse, and to forward them to the Local Government Board for their sanction. The works shown on the plans are estimated by the Engineer-in-Chief to cost 2,855*l.*, and comprise the provision of additional sanitary accommodation and the extension of the laundry.

LAW REPORTS.

CHANCERY DIVISION.
(Before Mr. Justice EVE.)

Party Wall Dispute.
Ellis *v.* Llewellyn.

THIS case was heard on June 16, and the plaintiff, Mr. Fredk. Walter Ellis, of Harding Villa, Eastbourne, sued Mr. Wm. Llewellyn, a builder, of Eastbourne, for an injunction to restrain him from building over or upon and from using or attempting to use as a party wall the western wall of the plaintiff's house, Harding Villa, or any part of such wall, and from otherwise trespassing upon or interfering with the plaintiff's house and premises except to the extent and in the manner mentioned in an agreement of February 21, 1911.

Mr. Adams, who appeared for the defendant, said that the real question between the parties was as to whether or not, upon the true construction of the short agreement of February last, he had the right to use one wall or another wall, one being the wall of the house and the other being a boundary party wall.

Mr. Beebee, for the plaintiff, said that the defendant had pulled down the party wall, and was going to make plaintiff's wall his external wall. All the paintiff wanted to do was to stop defendant from any further operations on that side of the premises.

After some discussion, his lordship assented to the motion standing over for a fortnight, the defendant in the meantime undertaking not to further build over or upon any part of the plaintiff's land or premises.

William Whiteley, Ltd.
Settlement of Action as to Buildings.

IN the Chancery Division on Thursday (15th) Mr. Justice Swinfen-Eady had in his list for trial the action of Gibbon *v.* William Whiteley, Ltd. The parties, however, conferred in Court for an hour and a half, and when his lordship took his seat after that interval he was informed that the delay had enabled them to come to terms, which would relieve his lordship of the necessity of hearing the case. Mr. Frank Russell, K.C., in making this announcement, said he appeared, with Mr. Cann, for the plaintiffs, and Mr. Buckmaster, K.C., and Mr. Byrne for the defendants. The action was brought to restrain the erection of certain buildings which faced the plaintiffs' premises opposite in Porchester-gardens at the junction of Porchester-gardens and Queen's-road, Bayswater. The plaintiffs were the freehold reversioners of the premises. By the terms come to the plaintiffs did not seek to obtain from the Court an injunction, the buildings having, in fact, been erected, or substantially, to their full height; but they proposed to take judgment for an agreed sum of 400*l.* as damages to the reversioners, and an order on the defendants to pay the taxed costs of the action, the costs to be taxed, as between solicitor and client. In addition to that the parties had come to certain terms, the short effect of which was that in the event of the plaintiffs' buildings having to be altered or rebuilt they should be at liberty to raise the front main wall of the buildings to a height equal to the existing height of the defendants' new parapet, but no higher, except in the event of Messrs. Whiteley at some future date raising the height of their buildings.

His lordship said the order would state that the plaintiffs and the defendants consented to judgment in the terms counsel had read, which would be set out, and there would be judgment for the plaintiffs for the sum of 400*l.* as the agreed amount of damages, and costs to be taxed between solicitor and client.

LONDON COUNCILS.

Barnes.—In order to increase the discharging capacity of the Castelnau sewer, a small pumping plant is to be put in, and the sewer in Madrid-road extended. The estimated cost is 400*l.* Plans have been passed for Mr. E. J. Partridge for eighteen houses, Rosslyn-avenue, and for Messrs. New & Son for a garage at "The Hermitage," Grange-road.

Croydon.—Plans, sections, and estimates have been submitted by the Sanitary Surveyor to the Rural District Council for making-up the following roads:—Oakwood-avenue, Mitcham, 437*l.*; Brambledown-road, Wallington, 1,126*l.*; Hall-road, Wallington, 646*l.*; Woodcote-avenue, Wallington, 758*l.* The final apportionment for the making-up of Gorringe Park-avenue, Mitcham, has been put at 181*l.* The necessary notices are to be served upon the owners. The following proposals have been passed:—Surrey Education Committee, school, Sandy-lane, Beddington; Mr. R. S. Smith, seven houses, Guy-road, Beddington; Messrs. Baines & Son, dairy, etc., Brighton-road, Beddington; Selected Estates Company, twenty-two houses, Eastbourne-road, Mitcham.

East Ham.—The Chief Sanitary Inspector, in his annual report, says that one regrets that the building by-laws do not give greater power over the quality of the materials used in new buildings when the health of the people depends as much upon what a house is built as the manner in which it is built. By the powers vested in the Council under the East Ham Improvements Acts, 100 superficial ft. of hard, durable paving can be insisted upon in all premises within the Borough. This concession, which Parliament conferred upon East Ham, has been of enormous benefit, although the full amount is seldom asked for, as it is not necessary. But a cement path immediately adjoining the brickwork at the back and front of a house is most essential, both for keeping the house dry and the floor clean. During the year notices have been served calling upon owners either to provide or repair paving of 646 houses, as compared with 738 for the previous year. The Inspector goes on to say that as regards nuisances, choked drains occupy the foremost position; the number of houses affected and attended to equals 2,117, being an increase of 512 for the previous year. In Beckton and North Woolwich Ward there are 2,605 houses, and at 525 of these it was necessary for the drains to receive attention, being equal to 20 per cent. These figures certainly appear large, but the explanation is that the system of drainage is of the kind known as "Combined," and if the main drain is choked near the sewer connexion it affects a large number of houses, and, judging from the articles frequently removed from drains, one is compelled to state that there has often been carelessnes on the part of the tenants. The work of unstopping and cleansing drains is carried out by the Council's own workmen, who have had many years' training, and are thoroughly capable men, experienced in their work, and conscious of its importance; they discharge their duties (which are most onerous and frequently dangerous) most creditably. During the year a large amount of time has been devoted to the testing and examination of drains, and at 748 houses the drains have been tested either by chemicals, smoke, or water, and in 310 instances defects have been discovered, with the result that at 249 of the premises it has necessitated the reconstruction of the drainage system, and at sixty-one houses the relaying of the branch-drain connexions. In addition, there has been 314 new soil pans and traps fixed, and nine new soil pipes erected. At the whole of these works of sanitary amendment the work has been done under the strict supervision of the District Inspector, and no pipes were permitted to be covered until the new work had been water-tested and passed. It occasionally happens that cheap and indifferent jobbers will try to complete the work before intimating to the Inspector that the work has commenced, notwithstanding the fact that it is specially pointed out in the notice served calling upon them to do the work, that information must be given to the Inspector before commencing, and a stamped postcard accompanies every drain notice. However, it is the general rule to inform the Inspector. Early in the year a conviction was obtained, and the work ordered by the court to be done a second time. In this case the owner only repaired a broken drainpipe at night by the aid of a candle light, the work being badly done. Under the East Ham Improvement Act, 1903, a person performing bad drain-work is liable to be proceeded against, and if his master can satisfy the court that he is not responsible, the workman himself is liable to conviction. The work connected with drainage reconstruction must be regarded as the most important devolving upon an Inspector; the fact that the work is hidden from view and defects (if any) cannot be seen adds to the responsibility of the person who supervises and passes it. One knows that to conscientiously discharge these duties involves the expenditure of much time, but it is a good investment for the prevention of recurrence of sanitary defects, which should be the primary object of a health official.

Finchley.—The following plans have been passed:—Sister Aldegundis, classrooms, rear of Nether-street; Messrs. Farebrother & Co., sixteen houses, Mountfield-road and Holly Park; Mr. A. Hutton, joinery works, Nether-street. Plans have been lodged by the following:—Brent Garden Village, Finchley, Ltd., three houses, Finchley-way, Brent Garden Village; Mr. J. Watts, twelve houses, Briarfield-avenue; Mr. E. C. Arden, two roads and sewers, near Manor Cottage Tavern; Chairman and Committee, Finchley Unitarian Church, church hall, etc., Granville-road.

Greenwich. — The annual report of the Medical Officer of Health (Dr. Ernest Annis) says that as regards the housing of the working classes, premises have been found to be overcrowded in thirty-four cases, which have all been abated, and in three cases the illegal use of underground rooms has been discontinued. Four hundred and fifty-seven houses have been generally repaired; 342 premises have been cleansed, limewashed, and repaired; twenty-nine have been improved as regards their ventilation; 202 premises have had the walls and ceilings cleansed throughout, and 256 premises have been partially cleansed; leaky house roofs and gutters have been repaired in 406 cases; nuisances from dampness have been abated in 123 cases; dampness of walls have been remedied in ninety-seven cases; direct connexion between the internal sanitary fittings of houses and the drain have been disconnected, trapped, and amended in 237 cases; similarly 107 stack-pipes have been disconnected, trapped, and amended; two houses have been abolished as unfit for habitation; and other nuisances, principally of dilapidations and want of underfloor ventilation, have also been attended to in thirteen cases. No definite proceedings have been taken either under the Public Health (London) Act, 1891, or the Housing of the Working Classes Acts for the closing of any properties, but in many instances requirements under notices to abate the nuisance arising on such properties have been of such an extensive character that the owners have themselves voluntarily closed eleven houses rather than spend the money required to put them into such a condition as to comply with the notices served upon them. The Greenwich Hospital Estates Department have been carrying out considerable improvements to their property in different parts of the Borough. A portion of the site of the "Ship" Hotel having been cleared, and upon this sixteen houses have been erected of a commodious type, including bathroom, lavatory basin, and drying closet, which conveniences are not usually included in working-class dwellings. These dwellings are let at an inclusive rental of 12s. per week. Other similar dwellings have also been erected by them in the Old Woolwich-road. Bath-rooms have been, and are being, provided in many of the older properties on the estate with the idea of bringing the property up to date and supplying a very necessary want. Notices of dilapidation have been served on other lessees on this estate, and in this way a good deal of work has been done by this body as landlords to improve their property, and at the same time provide working-class dwelling accommodation. London is still without any satisfactory solution to the difficult question of combined drainage, and the problems that frequently arise are the occasion of increasing expenditure on behalf of the Council which ought morally to be defrayed by the property owners themselves. There is an increasing tendency among sanitary authorities outside London to promote Bills dealing with this question, either by combination or otherwise, and it is sincerely to be hoped that at no distant date London sanitary authorities will adopt similar methods.

Hampstead.—Plans have been passed for Mr. R. C. Edwards, Norfolk-street, Strand, W.C., for the enlargement of the Blind School in Upper Avenue-road.

Hendon.—Plans and estimates have been approved for making-up the following streets: — Thorverton-road, Caddington-road, Middleton-road, Corringham-road, Temple-gardens, St. John's-road, Byron-road, part of Templar's-avenue, part of Ravenscroft-avenue, and part of Wentworth-avenue. A suggestion by the Surveyor for permission to use tarmac in connexion with the road construction works was approved. Application is to be made to the Local Government Board for sanction to borrow 622*l.* for kerbing and channelling works proposed to be carried out in Bittacy-hill, Mill Hill. The Surveyor has been instructed

to submit estimates for kerbing and channelling portion of the footpath in Finchley-lane; also for making-up the road leading from Saunder's-place by the side of the railway approach. The Surveyor is also to bring up a report at the next meeting of the Fire Brigade Committee as to the estimated cost of establishing a permanent fire-station on a site adjacent to the Council offices with accommodation for all necessary fire appliance and for a staff of six permanent firemen; also for the establishment of suitable sub-stations at Golder's Green and Mill Hill with accommodation in each case for two permanent firemen. The work of piping the ditch in Hammer's-hill is to be carried out at a cost of 100*l*. The Council have approved the plans submitted by the Borough Surveyor for a new mortuary on a site at the rear of the Council offices. The estimated cost is put at 779*l*. 11s. Application is to be made to the Local Government Board for sanction to borrow 800*l*. for the above work. The following plans have been passed:—Messrs. Edmondsons, Ltd., six shops, Golder's Green-road, also two houses, Golder's Green-crescent; Mr. A. Phillips, motor house, Caddington-road; Hampstead Garden Suburb, manse and house, Central-square; Mr. H. A. Champ, three houses, Shakespeare-road; Second Hampstead Tenants, Ltd., three pairs of houses, Addison-way, ten cottages, Erskine-hill, and pair of houses, Corringham-road; Messrs. C. F. Cheshir, four houses, Millway; the London Cremation Company, columbarium; Messrs. Haymills for Mr. E. Streather, three houses, Golder's Green-road; Kensington Freehold Land Trust, twelve houses, Brockenhurst-gardens, Mill Hill; Messrs. Evans & Son, ten houses, Limes-avenue, Golder's Green.

Hornsey.—The Borough Engineer and Surveyor was instructed at the last meeting of the Council to prepare plans and estimates, and, on receipt of the approval of the Local Government Board, to prepare contract drawings, specifications, and quantities, for the erection of workmen's dwellings at Highgate at an estimated cost of 36,000*l*. As soon as possible tenders are to be invited for the execution of the sewage works. It was mentioned by Alderman West, Chairman of the Housing Committee, that building operations might be in hand by the beginning of the new year if no further obstacles were placed in the way by the Local Government Board. Mr. Thos. Adams, of Wood Green, is to make-up Linden-road at a cost of 1,458*l*. The following plans have been passed:—Mr. A. Pirie, 40, Hearneville-road, Balham, six houses, Springcroft-avenue, Muswell Hill; Mr. E. A. Lewis, ten houses, Springcroft-avenue, Muswell Hill; alterations and additions to All Saints' Church, Highgate; Mr. John Farrer, three houses, Redston-road, Hornsey; Messrs. Fredrick Bros., two houses, Cholmeley Park, and two in Causton-road, Highgate; Messrs. F. Cottrell, Ltd., Crouch Hill, alterations and additions to laundry, The Grove, Hornsey; Mr. Edward Smith, Rosebery-avenue, Clerkenwell, dental workshop, rear of 33, Muswell-rise.

Lewisham.—The roadway of a portion of Algernon-road is to be repaired at an estimated cost of 325*l*. The tender of Messrs. Usher & Co., Ltd., has been accepted at 256*l*. 16s. for supplying and erecting the iron and steel work and galvanised-iron roofing, etc., to the cartshed at the Wearside-road depôt. The following plans have been passed:—Messrs. A. Roberts & Co., Ltd., eight houses, Guibal-road; Mr. A. J. Roddis, six houses, Rushford-road; Mr. Jas. Watt, seven houses, Glenton-road; Mr. F. G. Crickett, houses, shops, and stores, Brownhill-road and Plassy-road.

Richmond.—The following plans have been passed:—Mr. J. Backhurst, on behalf of Messrs. Leach Bros., alterations and additions, 13, King-street; Mr. H. G. Leslie, three houses, Fitzwilliam-avenue; Mr. E. J. Partridge, six houses, Martin's Cottages; Mr. F. J. Fisher, alterations and additions to "Forester's Arms," George-street.

Watford.—The Rural District Council has passed a plan for alterations and additions to "Stanborough" for the Seventh Day Adventist Union, Ltd.

Westminster.—A joint Sub-Committe of the Works Committee and the Public Health Committee have considered matters in regard to the approval of plans and supervision of construction of drains. The Sub-Committee have come to the conclusion that the control of work under the existing system is unsatisfactory, and that it would be advantageous to the Council and more convenient to owners of property and builders if the supervision of all drainage works (except that part of the drain which lies between the intercepting trap and the sewer) and the construction of all water closets, soil pipes, and other apparatus, and the approval of all plans relating thereto, were referred to the Public Health Committee and the Public Health Department, and that the supervision of the construction of so much of each drain as lies between the intercepting trap and the sewer be referred to the Works Committee and the Works Department. The by-laws relating to the deposit of drainage plans requires that all plans shall be deposited in duplicate, and in future one copy of each plan is to be deposited with the City Engineer and one with the Medical Officer of Health. This will enable the Works Department, as at present, to deal with the important question of the depth of the basement in its relation to the sewer in the case of new buildings or the re-erection of old buildings. The Improvements Committee have again considered a notification from the London County Council with regard to an application from Mr. John Murray, F.R.I.B.A., 11, Suffolk-street, S.W., for consent to proposed new building lines for portions of Glasshouse-street, the Quadrant, Piccadilly, Piccadilly-circus, and Regent-street. The Committee are still of opinion that advantage should be taken of the pulling down of the property lying between Regent-street and Glasshouse-street for the widening of the latter thoroughfare, more especially in view of the proposed erection, at an early date, of a large hotel on the north side of Glasshouse-street. Mr. Keynes Purchase, F.R.I.B.A., 20 and 22, Maddox-street, W., has intimated to the Council that clients of his have acquired a long leasehold interest in Nos. 16 and 17, Poland-street, and that they are about to expend a considerable sum of money in erecting new buildings in place of the existing ones. Mr. Purchase mentions that he has heard that a scheme is suggested for opening out a new thoroughfare between Regent-street and Oxford-street by way of Great Marlborough-street and Noel-street, and that these two houses, which form the nucleus of the position, would have to be removed to enable such a scheme to be carried out. Plans had already been prepared for putting up these new buildings, but before going further he is instructed to inquire, was there any likelihood of such a scheme being proceeded with. The Improvements Committee have decided that the Council should put in force the provisions of the Michael Angelo Taylor's Act for the acquisition of the interests in the site of the two houses in question.

Woolwich.—Portions of Glyndon-road, Plumstead, are to be relaid with the Council's slab paving at an estimated cost of 112*l*. The following plans have been passed:—Mr. W. Dieselhorst, Bowater-road, Woolwich, rubber shops, etc., Harden's Manorway, for Messrs. Siemens Bros. & Co., Ltd.; Mr. J. W. Stonhold, 425, Birkbeck Bank-chambers, Holborn, W.C., cinematograph theatre, High-street, Plumstead, for the Plumstead Cinematograph Company (E. W. Peall, secretary); Mr. H. Parkinson, 106, Camberwell-road, S.E., additions and alterations to the "Windsor Castle" public-house, Maxey-road, Plumstead.

FOREIGN AND COLONIAL.

Metal Lathing, etc., Costa Rica.

The following information is from the report by H.M. Consul at San José (Mr. F. N. Cox) on the trade of Costa Rica in 1910, which will shortly be issued:—Severe shocks of earthquake occurred in San José, Cartago, and adjacent districts on April 13, 1910, causing very general damage to buildings. Shocks of varying intensity continued daily for two months, and on May 4 a shock of great violence destroyed the city of Cartago almost completely, and caused the death of about 500 inhabitants. The damage to property exceeded 500,000*l*. The rebuilding of Cartago has been commenced, and a considerable impetus has been given to the building trade in the capital. A demand has sprung up for metal lathing, light structural iron, roof iron, and Portland cement.

TRADE CATALOGUES.

The Indestructible Paint Company, of King's House, King-street, London, E.C., send us particulars of Browning's colourless preservative solution. An important feature of this preservative is that it is colourless, and does not alter the appearance of the building by hiding the grain of the stonework or other material to which it is applied. The firm draw attention to the fact that the best time for this work is during a period of warm, dry weather, when the walls are dry and in an absorbent condition. Among the many structures which have been treated with the preservative are Cleopatra's Needle, Westminster Abbey, and St. Paul's Cathedral. A better testimonial would be hard to find.

Messrs. Thomas Crapper & Company, Ltd., sanitary engineers, of Chelsea, forward us a price list of a few of their specialities. Crapper's silent valveless water-waste preventer and the "Improved Kenon" disconnecting trap must be already known to the majority of our readers; nor need we do more than remind them of the tried excellence of the other sanitary appliances of every type manufactured by the firm.

Mr. Alexander G. Lee, of 14, John-street, Bedford-row, sends us a catalogue and price-list of the "All Time" sheet lead damp-course. The lasting qualities of the material are well illustrated by the ancient lead anchor of the Græco-Roman period now in the British Museum, which, after an immersion of close upon two thousand years, is nearly as perfect as when the lead first left the casting ladle. Starting from this test, Mr. Lee has drawn the practical conclusion that sheet lead should be equally lasting when employed as a damp-course, a conclusion which we see no reason to doubt. The sheet lead is made in all wall-widths, and is embedded in two protecting layers of a specially-prepared fibrous asphalted sheeting. Apart from the lowness of the first cost, the ease with which the damp-course may be laid must result in a considerable saving of labour, and consequently of money. Among users of the "All Time" damp-course are the Admiralty, the War Office, the Great Western Railway Company, and many leading architects.

We have received from the Bowesfield Steel Company, Ltd., of Stockton-on-Tees, a neat little pocket-book containing particulars of the steel sheets (black and galvanised, plain and corrugated) manufactured by them. They also supply all such accessories as bolts and nuts, gutters, ridging, downpiping, rain-water heads, etc. Useful tables and blank pages for memoranda bound up at the end maintain the pocket-book character of this handy little list, which the firm have specially issued for the Coronation Exhibition, where they are showing samples of their manufactures. The London office and export sale department is at 110, Cannon-street, E.C.

The Beeston Foundry Company, Ltd., of Beeston, Notts, forward us their latest illustrated catalogue of boilers, radiators, pipes, and valves. Attention is specially drawn to the "Duchess" radiator, fitted with the new "Beeston" radiator valve. We need hardly remind our readers that the Beeston Foundry Company are the manufacturers of the well-known "Robin Hood" sectional boilers. The "F" pattern small-sized boiler should meet a wide demand. For low price and good quality it would be hard to beat the "CX" pattern of the Beeston domestic boiler.

Messrs. Matthew Wylie & Co., of 57, Robertson-street, Glasgow, and Balfour House, Finsbury-pavement, London, E.C., send us some illustrations of houses constructed of hollow concrete blocks, as made by their "Ideal" concrete block-moulding machine. Considerable variety of design is consistent with the employment of this material, the adoption of which is likely to become more and more widespread in the near future.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

June 2.—By KNIGHT, FRANK, & RUTLEY.

Stockton, Yorks.—Sandburn Estate, 467 a. 0 r. 12 p., f.	£6,300

By FRANKLIN & GALE.

North Moreton, Berks.—The Filberts and 1 a. 1 r. 26 p., f.	303
Blewbury, Berks.—Gables Farm, 78 a. 0 r. 37 p., f.	1,380

June 8.—By KNIGHT, FRANK, & RUTLEY.

Stone, Stafford.—Trentham Estate, 763 a. 1 r. 35 p., f.	18,375

By BOARDMAN & OLIVER.

Little Cornard, Suffolk.—Yorley Farm, 78 a. 0 r. 39 p., f.	1,200
Lavenheath, Suffolk.—Heath Farm, 162 a. 2 r. 9 p., f.	2,200
Boxford, Suffolk.—Turk's Hall Farm, 123 a. 0 r. 5 p., f.	2,100

June 9.—By G. B. HILLIARD & SON.

Pleshey, Essex.—House and 1 r. 2 p., f. and c.	215
Five cottages, f., w.r. 19*l*.	13

By THOS. WM. GAZE & SON.

Shelfanger, Norfolk.—Poplar Farm, 115 a. 3 r. 11 p., f.	1,175
Fersfield, Norfolk.—Farm, 71 a. 2 r. 24 p., f.	1,000

June 10.—By THOS. WM. GAZE & SON.

Tivetshall, Norfolk.—Station Farm, 52 a. 3 r. 23 p., f.	1,600
Weybread, Suffolk.—Pecks Farm, 25 a. 1 r. 0 p., f.	460

By FRANKLIN & JONES.

South Leigh, Oxon.—Part of Eynsham Hall Estate, 437 acres, f.	7,972
Eynsham, Oxon.—Enclosures of arable land, 26 a. 2 r. 26 p., f.	600
Stoke Lyne, Oxon.—Bainton Farm, 193 a. 0 r. 27 p., f.	1,649

RECENT SALES—*Continued on page 798.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, iv.; Contracts, iv. vi. viii. x.; Public Appointments, xvii.; Auction Sales, xxii.

Certain conditions beyond those given in the following information are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

***** It must be understood that the following paragraphs are printed as news, and not as advertisements; and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.**

Competitions.

JUNE 28.—**Newton Abbot, Devon.**—BUILDINGS FOR AGRICULTURE AND TECHNICAL INSTRUCTION, SEALE-HAYNE COLLEGE, NEWTON ABBOT.—The Governors invite designs and estimates. The assessor is Mr. C. Steward Smith, F.R.I.B.A., of Reading. Premiums 100*l.*, 50*l.*, 30*l.*

JULY 31. — **Lowestoft.** — SCHOOL. — The Lowestoft Education Committee invite designs for an elementary school for 500 boys at Romanhill. Three premiums are offered. See advertisement in issue of June 16 for further particulars.

JULY 31. — **Wellington.** — NEW PARLIAMENT BUILDINGS.—Premiums of 1,000*l.*, 500*l.*, 300*l.*, and 200*l.* are offered for the competitive designs. Particulars from the Minister of Public Works, Wellington, New Zealand.

AUGUST 15.—**Berne.**—MONUMENT.—Designs for the erection of a monument at Berne to celebrate the foundation of the International Telegraph Union. Conditions may be seen in the library of the Royal Institute of British Architects.

SEPTEMBER 12-25.—**Athens.**—COURT OF JUSTICE. —An international competition is instituted by the Ministry of the Interior, for the erection of Court buildings, to cost 160,000*l.* The *Official Gazette* may be seen at the Library of the R.I.B.A.

NOVEMBER 1. — **City of St. Petersburg.** — MONUMENT TO ALEXANDER II.—Particulars in our issue of August 13, 1910.

DECEMBER 29. — **Glasgow.** — DESIGN FOR A BRIDGE.—Designs are invited (Alexander Thomson Travelling Studentship) for a bridge. Preminums of 60*l.* and 20*l.* are offered. See advertisement in issue of December 24 for further particulars.

NO DATE.—**Holland.**—STAINED GLASS WINDOW. —Designs are invited for a stained glass window to be erected in the University at Groningen. See advertisement in issue of June 9 for further particulars.

Contracts.

BUILDING.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

JUNE 22.—**Southampton.**—SESSION COURT.—Reconstruction and enlargement of the Gosport Petty Sessional Court, and erection of magistrates' room and offices, with certain alterations to the police-station. Plans and specification seen, and quantities from Mr. W. J. Taylor, County Surveyor, The Castle, Winchester. Deposit of 2*l.* 2s.

JUNE 23.—**Llandovery.**—HOUSES.—Erection of six houses. Plans and specification with Mr. Thomas Roderick, architect, Ashbrook House, Aberdare.

JUNE 24.—**Bangor.**—ADDITIONS.—Alterations and additions to Maesmawr Penrhosgarnedd. Plan and specification with Mr. W. G. Williams, 202, High-street, Bangor.

JUNE 24.—**Dalton.**—SCHOOL.—Erection of a new school. Plans seen, and quantities, on deposit of 1*l.*, from Education Architect, County Hall, Wakefield.

JUNE 24.—**Denholme.**—ALTERATIONS.—Alterations, etc., to school. Plans seen, and quantities, on deposit of 1*l.*, from the Education Architect, County Hall, Wakefield.

JUNE 24. — **Llanddewi-Brefi.** — CHURCH.—Restoration of the church. Plans and specifications with Mr. R. S. Rowland, Garth.

JUNE 24.—**Penmaenmawr.**—SCHOOL.—Erection of a Council school at Capelulo. Mr. Rowland Lloyd Jones, County Architect, 14, Market-street, Carnarvon.

JUNE 24.—**Stockport.**—EXTENSIONS.—Dialstone-lane Hospital extension. Quantities, on deposit of 3*l.* 3s., from the architect, Mr. James Jepson, 35, Great Underbank, Stockport.

JUNE 26.—**Milntown.**—HOUSE.—Erection of a house. Plans and specifications with Mr. Thos. Munro, architect, 62, Academy-street, Inverness.

JUNE 26. — **Nottingham.** — ALTERATION.—For alteration of the Residence, Edwards-lane, for the accommodation of children. Specifications from Mr. W. B. Starr, architect, 12, Victoria-street, Nottingham. Deposit of 2*l.* 2s.

JUNE 26.—**Steyning.**—ADDITIONS, ETC.—Alterations and additions to the Grammar School. Plans and specification seen, and quantities, on deposit of 1*l.* 1s., from Mr. Haydn P. Roberts, A.R.I.B.A., County Education Architect, Thurloe House, High-street, Worthing.

* JUNE 27. — **Cardiff.** — MUSEUM. — The Amgueddfa Genedlaethol Cymru National Museum of Wales invite tenders for excavations, foundations, and the building of sub-basement and basement of first portion of the above. See advertisement in this issue for further particulars.

JUNE 27.—**Derby.**—SHEDDING.—Erection of proposed shedding, Ford-street Yard. Plans seen, and specification and quantities from Mr. John Ward, M.Inst.C.E., Borough Surveyor, Borough Surveyor's Office, Babington-lane, Derby.

JUNE 27.—**Epsom.**—PAVILION, ETC.—Erection of a pavilion and lodge at Recreation Ground. Plans and specification seen, and quantities from Mr. Edward Robert Capon, Surveyor, Bromley Hurst, Church-street, Epsom.

JUNE 27.—**New Cumnock.**—CHURCH.—Erection and completion of a church and vestries, with enlarging of school hall. Plans and specifications at the School Hall, Castlehill, New Cumnock. Schedules from Mr. W. Beddoe Rees, architect, Cardiff Office, 3, Dumfries-place, on deposit of 1*l.* 1s.

* JUNE 28.—**Chesham.**—SCHOOL.—The Bucks Education Committee invite tenders for the erection of an elementary school for 450 children, and a special subjects' centre. See advertisement in this issue for further particulars.

JUNE 28.—**Darlington.**—GALLERY.—Erection of a gallery and internal alterations at the Public Library. Plans and specification seen, and quantities, on deposit of 2*l.* 2s., from Mr. George Winter, Borough Surveyor, Town Hall.

JUNE 28.—**Otterburn.**—HOUSE.—Erection of a house at Otterburn. Plan and specification with the architect, Mr. C. Franklin Murphy, Morpeth.

JUNE 29.—**Bath.**—DESTRUCTOR.—Erection of a refuse destructor. Plan, specification, and particulars at the City Surveyor's Office, Guildhall, Bath. Deposit of 1*l.* 1s.

JUNE 29.—**Dewsbury.**—MILL.—Re-erecting a woollen mill at Spinkwell. Plans and specifications seen, and quantities from Messrs. Kirk, Sons, & Ridgway, architects, surveyors, and valuers, Market-place, Dewsbury.

JUNE 30.—**Somerset.**—OFFICES, ETC.—Erection of offices, cloakrooms, etc., at the Otterhampton Council School. Plans and specification with Messrs. Samson & Colthurst, 51, High-street, Bridgwater.

JUNE 30.—**Taunton.**—COTTAGE.—Erection of a cottage at Cothelestone. Drawings and specification with Mr. George C. Strawbridge, M.S.A., 25, Alma-street, Taunton.

JULY 1.—**Sevenoaks.**—STOREROOM.—Formation of a storeroom at the School. Specifications by the Architect, Mr. Wilfred H. Robinson, of Caxton House, Westminster.

JULY 3. — **Birr.** — DWELLINGS. — Erection of twenty-eight dwellings. Plans and specifications with Mr. Henry Browne, A.M.Inst.C.E.I., Town Surveyor, Town Hall, Birr.

JULY 3.—**Greenwich.**—REPAIRS.—External repairs at the Borough Hall, Royal-hill. Specification seen, and form of tender from Borough Engineer, Town Hall, Greenwich.

JULY 4.—**Hemel Hempsted.**—SCHOOL.—Erection of a school. Drawings seen, and specifications and quantities from Mr. Walter R. Locke, Town Hall, Hemel Hempsted, on deposit of 5*l.*

JULY 4.—**Kingstown.**—LIBRARY.—Erection of the Carnegie Library. Plans and specification with the architects, Messrs. O'Callaghan & Webb, 31, South Frederick-street, Dublin.

JULY 6.—**Merthyr Tydfil.**—RAILING, ETC.—Erection of a fenced wall and iron railing around the site of the proposed Sanatorium at Pontsarn. Plan and specification with the architect, Mr. Thomas Roderick, Clifton-street, Aberdare.

JULY 6.—**Truro.**—ALTERATIONS, ETC.—Erection of additions and alterations to Truro Post Office. Plans and specification with Mr. Leonard Winn, architect and surveyor, 27, Boscawen-street, Truro.

* JULY 7. — **Edenbridge.** — ALTERATIONS.—The Kent Education Committee invite tenders for the execution of certain alterations, etc., to a school. See advertisement in this issue for further particulars.

JULY 11.—**Rochester.**—BATH.—Construction of an open-air swimming bath. Drawings and specifications with Mr. William Banks, A.M.Inst.C.E., Guildhall, Rochester.

* JULY 11.—**Wenford Bridge.**—CHINA CLAY KILN.—The North Cornwall China Clay Company (1908), Ltd., invite tenders for building a china clay kiln. See advertisement in this issue for further particulars.

JULY 14.—**Wigan.**—SCHOOL.—Erection of an elementary school at Billinge. Plans seen, and quantities, on deposit of 2*l.*, from the County Architect, Mr. Henry Littler, 16, Ribblesdale-place, Preston.

JULY 17.—**Gateshead.**—ASYLUM.—Erection and completion of the superstructure of the proposed new lunatic asylum. Drawings and specifications with the architects, Messrs. George T. Hine & H. Carter Pegg, of 35, Parliament-street, Westminster. Quantities from Messrs. Allen & Partners, of Grainger-street West, Newcastle-on-Tyne. Deposit of 5*l.*

JULY 17.—**Merthyr Tydfil.**—VILLAS, ETC.—Erection of five pairs of semi-detached cottage villas, and twenty cottages, with the construction of roads, sewers, etc., at Troedyrhiw, for the Cwmdu Building Club. Plans and specification with Mr. T. Edmund Rees, architect, Merthyr Tydfil.

NO DATE.—**Chesterfield.**—ADDITIONS.—Alterations and additions to The Flying Dutchman, Knifesmith Gate. Plans and quantities from Mr. W. Cecil Jackson, M.S.A., architect and surveyor, 29, Knifesmith Gate, Chesterfield.

NO DATE.—**Dolgelley.**—HOUSE.—Erection of a house. Plans and specifications from Messrs. Deakin & Howard Jones, M.S.A., Plas Ynys, Borth, S.O.

NO DATE.—**Hereford.**—ALTERATIONS, ETC.—New parish room at Canon Pyon, also alterations, etc., at Canon Pyon schools. Plans and specification with Mr. Herbert Skyrme, architect, 138, Widemarsh-street, Hereford.

NO DATE.—**Ireland.**—IMPROVEMENTS.—Extension and improvements to business premises, Coalisland, Co. Tyrone. Plans and specifications with Messrs. E. & J. Byrne, architects, 4, Waring-street.

NO DATE.—**London, N.**—ADDITIONS.—For additions to chair factory, at Mendy-street, High Wycombe. Mr. Thos. Thurlow, Architect, High Wycombe.

NO DATE.—**Newcastle-on-Tyne.**—PREMISES.—Erection of premises for Framwellgate Moor Co-operative Society, Ltd. Architect, Mr. L. G. Ekins, Co-operative Wholesale Society, Ltd., West Blandford-street, Newcastle-upon-Tyne.

ENGINEERING, IRON, AND STEEL.

JUNE 22. — **West Derby.** — DISINFECTING APPARATUS.—Installing steam disinfecting apparatus and steam piping at the Cottage Homes for Children, Fazakerley. Specification from Mr. Harris P. Cleaver, Union Clerk, Union Offices, Brougham-terrace, Liverpool.

JUNE 27.—**Truro.**—BRIDGE.—Erection of a bridge at Carvinack Watering, between Gerrans and St. Just. Plan and specification with Mr. Coulter Hancock, 12, Princes-street, Truro.

JULY 3. — **London.** — SHAFT. — The Battersea B.C. invite tenders for the erection of a chimney-shaft at the Public Baths, Latchmere-road, Battersea. Plans, specification, and particulars from Mr. W. Marcus Wilkins, Town Clerk, Town Hall, Battersea.

* JULY 4.—**London, N.W.**—MOTOR FIRE-ENGINE.—The Willesden D.C. invite tenders for a fire brigade petrol motor. See advertisement in this issue for further particulars.

JULY 5.—**Abeokuta, Southern Nigeria.**—PLANT, ETC.—Supply and delivery of pumping plant. Specification and form of tender, on deposit of 5*l.*, from Mr. Alfred M. Buchanan, Suffolk House, Laurence Pountney-hill, E.C.

JULY 6.—**Ireland.**—LIGHTSHIP.—Construction of an iron and steel lightship. Drawings and specification from Mr. Hubert G. Cook, Secretary, Irish Lights Office, D'Olier-street, Dublin.

NO DATE.—**Thurnscoe.**—ENGINES, ETC.—Supply of pumps and engines, erection of engine-house, etc. Particulars from Mr. J. Ledger, Hawksworth, Clerk, Council Offices, Bolton-upon-Dearne.

FURNITURE, PAINTING, MATERIALS, etc.

JUNE 29.—**Belper.**—PAINTING.—For painting at Belper Isolation Hospital. Specification at the Hospital. Mr. Joseph Pym, Clerk, Belper.

* JUNE 30.—**Leyton.**—PAINTING AND CLEANSING. —The Leyton U.D.C. invite tenders for painting and cleansing various schools during the summer vacation. See advertisement in this issue for further particulars.

* JULY 4.—**Belvedere.**—REMOVAL OF ASHES, ETC.—The London C.C. invite tenders for the removal and disposal of furnace ashes, clinker, dust, etc., from main drainage outfall works at Crossness, near Belvedere, Kent. See advertisement in this issue for further particulars.

JULY 6.—**London.**—PAINTING, ETC.—For painting and cleaning work at Infirmary, Marloes-road, Kensington. Specification from Mr. W. R. Stephens, Clerk to the Guardians, Guardians' Offices, Marloes-road, Kensington, W.

FURNITURE, etc.—*continued.*

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

✱ JULY 7.—**Dartford.**—REPAIRS AND PAINTING.—The Kent Education Committee invite tenders for painting and repairs to a school. See advertisement in this issue for further particulars.

JULY 8.—**Wimbledon.**—CLEANING, ETC.—Painting and cleaning the interior of the Library. Specifications from Mr. Henry Wm. Bull, Borough Librarian, Public Library, Wimbledon.

✱ NO DATE.—**Greenwich.**—REPAIRS TO SCHOOL. The Governors of the Roan Schools invite tenders for repairs to the schools. See advertisement in this issue for further particulars.

ROADS, SANITARY, AND WATER WORKS.

JUNE 24.—**Golcar.**—SEWAGE.—Construction of joint outfall works. Plans and specifications seen, and quantities, on deposit of 5*l.*, from the engineers, Messrs. Abbey & Hanson, C.E., 11, Cloth Hall-street, Huddersfield.

JUNE 24.—**Huddersfield.**—SEWERAGE.—Construction of the joint outfall works at Johnny Moor-hill, near Huddersfield. Plans and specifications seen, and quantities, on deposit of 5*l.*, from Messrs. Abbey & Hanson, C.E., 11, Cloth Hall-street, Huddersfield.

JUNE 24.—**Maltby.**—SEWAGE.—Construction of sewers and sewage-disposal works. Plans seen, and quantities, on deposit of 2*l.* 2s., from Mr. B. Hey, Surveyor to the Council, at the Imperial-buildings, Rotherham.

JUNE 29.—**Llansilin.**—DRAINAGE.—For highway drainage works near Llanrhaiadr. Plans and specification with Mr. E. Vaughan-Edmunds, M.I.Mun.E., Surveyor, Llanrhaiadr.

✱ JULY 4.—**London, N.W.**—ROADMAKING.—The Willesden D.C. invite tenders for roadmaking and paving works in Coverdale-road, Brondesbury, and Palermo-road, Harlesden. See advertisement in this issue for further particulars.

✱ JULY 11.—**London.**—WOOD-BLOCK FLOORING.—The London C.C. invite tenders for providing and laying wood-block flooring at school buildings, etc. See advertisement in this issue for further particulars.

NO DATE.—**Cardiff.**—SEWERAGE.—For small road and sewerage contract. Mr. J. A. Sant, architect and surveyor, St. John's-square, Cardiff.

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*DEALS, BATTENS, BOARDS, TIMBER, ETC.—Great Hall, Winchester House, E.C.	Churchill & Sim	June 28
*FREEHOLD ESTATE, SHORTLANDS, KENT—At the Mart	Baxter, Payne, & Lepper	July 5
*FREEHOLD BUILDING ESTATE, CLAPHAM—At the Mart	Bunch & Duke	July 7
*FREEHOLD PROPERTIES, HORSHAM—King's Head Hotel, Horsham	King & Chasemore	July 17
*THE LEGGATT'S ESTATE, POTTERS BAR—At the Mart	John D. Wood & Co.	July 18

RECENT SALES—*Continued from page 796.*

June 12.—By DRIVER, JONAS, & Co.

Roestock, Herts.—Two cottages and 1 r. 12 p., f.	£200
Colney Heath, Herts.—Arable field, 2 a. 1 r. 25 p., f.	120

By DUNCAN & KIMPTON.

Cheapside.—15, King-st. (shop and offices), f., gross rental 715*l.*	9,800
Tunbridge Wells, Kent.—1 and 2, Hill Brow, f., y.r. 200*l.*	2,000

By KEMSLEY.

Foulness, Essex.—Small Gains and Small Ports Farms, 351 a. 3 r. 23 p., f.	1,700
Woodford.—1 to 4, Conway-villas and plot of land, f., w.r. 62*l.* 8s.	320

By KING & CHASEMORE.

Greatham, Sussex.—Greatham and Washington Commons and Humphreys Farm, 80 a. 1 r. 14 p., f.	1,640

By ALFRED SAVILL & SONS.

Heybridge, Essex.—Heybridge Mill and 8 a. 3 r. 29 p., f.	1,000
Pasture land, 1 a. 2 r. 8 p., f.	130
Pasture land, 39 a. 2 r. 28 p., f.	800
Impropriate rectorial tithe rent-charge (commuted value) 95*l.* 6s. 7d.	800

June 12.—By DANIEL SMITH, SON, & OAKLEY.

Brockley.—Brockley-rd., Buckthorne-rd., Eddystone-rd., etc., f.g. rents 81*l.* 10s., reversion in 91 yrs.	2,298
Hazeldon-rd., etc., f.g. rents 195*l.*, reversion in 66 yrs.	4,495

June 13.—JOHN G. DEAN & Co.

Balham.—57, 59, and 61, Balham Park-rd., f., y.r. and e.r. 114*l.*	1,300

By FLEURET, ADAMS, & HAXELL.

Canning Town.—Freemasons-rd., Royal Albert p.h., also two houses and shop adjoining, lease for 32 yrs. at 150*l.*, with goodwill	17,800

By FAREBROTHER, ELLIS, & Co.

Ropley, Hants.—Impropriate tithe rent-charge (commuted value) 95*l.* 11s. 2d.	1,000
Shepherd's Bush.—Goldhawk-rd., f.g. rents, 63*l.*, reversion in 75 yrs.	1,420
Goldhawk-rd., f.g.r. 8*l.* 8s., reversion in 37 yrs.	180
Pimlico.—Ebury-st., l.g.r. 36*l.*, u.t. 12 yrs., g.r. 2*l.*	170

By R. W. FULLER, MOON, & FULLER.

Croydon.—108, Church-st. (s), u.t. 85 yrs., g.r. 8*l.*, y.r. 40*l.*	280

By WEATHERALL & GREEN.

Exeter.—Plymouth-rd., Well Park Brewery with 16 tied houses, f. and l. (as a going concern)	20,500

By EDWIN FOX, BOUSFIELD, BURNETTS, & BADDELEY.

Brixton —26 and 28, Brixton-hill; 1 to 11 (odd) Acre-la., area 4 a. 0 r. 6 p., f., y.r. 566*l.* 10s.	18,000
Brixton-hill, f.g. rents 74*l.*, reversion in 26 and 28 yrs.	2,300
Brixton-hill, f.g. rents, 4*l.* 10s., reversion in 55¼ and 63¼ yrs.	220
Church-rd., f.g.r. 22*l.* 10s., reversion in 63¼ yrs.	540
Brixton-hill, f.g. rents, 76*l.*, reversion in 58¾ yrs.	1,860
Brixton-hill, f.g. rents, 91*l.*, reversion in 62 and 64 yrs.	2,150
Acre-la, f.g. rents, reversion in 12 yrs.	1,050
Acre-la., f.g. rents 34*l.* 5s, reversion in 53 yrs.	1,185

By FOSTER & CRANFIELD.

Northam, Devon.—Westward Ho! Estate (Royal and Bath Hotels; 1 to 9, Springfield-ter., f.g. rents 56*l.* 7s. 6d.; three residences, area 59 a.), f.	16,000

By H. & R. L. COBB.

Sellinge, Kent.—Rhode Farm, 50 a. 2 r. 7 p., f.	1,750
Stanford, Kent.—Pasture land, 11 a. 1 r. 9 p., f.	325
Dymchurch, Kent.—Mount Pleasant and 8 a. 2 r. 30 p., f.	575
Laburnam Cottage, f.	520
Post-office and shop, f.	340
Grove House and 1 a. 2 r. 6 p., f.	1,000
Boat House Cottage and coalyard, f.	185
New Romney, Kent.—Pasture land, 29 a. 2 r. 9 p., f.	£990
Ivychurch, Kent.—Marsh land, 7 a. 0 r. 17 p., f.	250
Two cottages and 47 a. 2 r. 38 p., f.	1,325
Newchurch, Kent.—Post-office and cottage, f.	360
Bonnington, Kent.—Burntdown Farm, 6 a. 3 r. 2 p., f.	330
Aldington, Kent.—Frith Farm, 10 a. 2 r. 33 p., f.	500
Cottage and 2 a. 0 r. 10 p., f.	150
Orlestone, Kent.—Stoakes cottage and 7 a. 0 r. 1 p., f.	465
Ashford, Kent.—Pasture land, 7 a. 3 r. 3 p., f.	350

By DRIVER, JONAS, & Co.

Selby, Yorks.—Bondgate Farm, 8 a. 3 r. 28 p., f.	1,000
Two fields, 12 a. 0 r. 7 p., f.	1,150
Arable land, 2 a. 2 r. 13 p., f.	115
Small Holding, 30 a. 3 r. 2 p., f.	1,500
Arable land, 16 a. 0 r. 39 p., f.	750
Spark Hagg Farm, 211 a. 3 r. 17 p., f.	6,250
Thorpe Hall Estate, 501 a. 0 r. 38 p., f.	13,600
Flaxley Lodge and Godfrey Hall Farms, 231 a. 3 r. 16 p., f.	7,500
Arable and pasture land, 77 a. 3 r. 35 p., f.	3,000
13, The Crescent (s.), f., y.r. 30*l.*	990
9 and 10, Park-st., f., y.r. 52*l.* 12s.	1,150
Market-pl., bank-premises, and 33, Finkle-st., f., y.r. 105*l.*	2,100

By ALFRED MANSELL & Co.

Baschurch, Salop.—Fenemere Estate, 971 a., f. (including timber)	28,004

Contractions used in these lists.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for offices; s. for shops; ct. for court.

PRICES CURRENT OF MATERIALS.

**** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

Per 1000 Alongside, in River.

	£	s.	d.
Best Stocks	1	13	0
Picked Stocks for Facings	2	10	0

Per 1000, Delivered at Railway Depôt.

	£	s.	d.		£	s.	d.
Flettons	1	9	0	Double Headers	13	7	6
Best Fareham Red	3	12	0	One Side and two Ends	17	7	6
Best Red Pressed Ruabon Facing	5	0	0	Two Sides and one End	18	7	6
Best Blue Pressed Staffordshire	3	15	0	Splays & Squints	15	17	6
Do. Bullnose	4	0	0	Best Dipped Salt Glzd. Str'tch'rs	10	17	6
Best Stourbridge Fire Bricks	3	14	0	Headers	10	7	6
GLAZED BRICKS.				Quoins, Bullnose, and Flats	14	7	6
Best White and Ivory Glazed Stretchers	10	17	6	D'ble Stretchers	16	7	6
Headers	10	7	6	Double Headers	13	7	6
Quoins, Bullnose, and Flats	14	7	6	One Side and two Ends	17	7	6
D'ble Stretchers	16	7	6	Two Sides and one End	18	7	6
				Splays & Squints	15	17	6

Second Quality White and Dipped Salt Glazed, £1 5s. per 1000 less than best.

	s.	d.	
Thames and Pit Sand	6	9	per yard, delivered
Thames Ballast	5	3	" "
Best Portland Cement	29	0	per ton, "
Best Ground Blue Lias Lime	19	0	" "

NOTE—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly dpt.

STONE.

Per Ft. Cube.

	s.	d.		s.	d.
BATH STONE—delivered on road waggons, Paddington Depôt	1	6½			
Do. do. delivered on road waggons, Nine Elms Depôt	1	8½			
PORTLAND STONE (20 ft. average)—					
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	1			
White Basebed, delivered on road waggons Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2	2½			

Per Ft. Cube, delivered at Railway Depôt.

	s.	d.		s.	d.
Ancaster in blocks..	1	10	Closeburn Red Freestone	2	0
Beer in blocks	1	6	Red Mansfield Freestone	2	4
Greenshill in blocks	1	10	Talacre & Gwespyr Stone	2	8
Darley Dale in blocks	2	4			
Red Corsehill in blocks	2	3			

YORK STONE—*Robin Hood Quality.*

Per Ft. Cube, Delivered at Railway Depôt.	s.	d.
Scappled random blocks	2	10

Per Ft. Super., Delivered at Railway Depôt.		
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2	3
6 in. rubbed two sides ditto, ditto	2	6
3 in. sawn two sides slabs (random sizes)	0	11½
2 in. to 2½ in. sawn one side slabs (random sizes)	0	7½
1¼ in. to 2 in. ditto, ditto	0	6

HARD YORK—

Per Ft. Cube, Delivered at Railway Depôt.		
Scappled random blocks	3	0

Per Ft. Super., Delivered at Railway Depôt.		
6 in. sawn two sides landing to sizes (under 40 ft. super.)	2	8
6 in. rubbed two sides ditto	3	0
3 in. sawn two sides slabs (random sizes)	1	2
2 in. self-faced random flags	0	5

SLATES.

Per 1000 of 1200 at Railway Depôt.

	£	s.	d.		£	s.	d.
In. In.				In. In.			
20×10 best blue Bangor	13	2	6	20×10 best Eur'ka unfading green	15	17	6
20×12 ditto	13	17	6	20×12 ditto	18	7	6
20×10 1st quality ditto	13	0	0	18×10 ditto	13	5	0
20×12 ditto	13	15	0	16×8 ditto	10	5	0
16×8 ditto	7	5	0	20×10 permanent green	11	12	6
22×10 best blue Portmadoc	12	12	6	18×10 ditto	9	12	6
16×8 ditto	6	12	6	16×8 ditto	6	12	6

TILES.

At Railway Depôt.

	s.	d.		s.	d.
Best plain red roofing (per 1000)	42	0	Do. Ornamental (per 1000)	52	6
Hip and Valley (per doz.)	3	7	Hip and Valley (per doz.)	4	0
Best Broseley (per 1000)	50	0	Best Ruabon red, brown, or brindled (Edw'ds) (per 1000)	57	6
Do. Ornamental (per 1000)	60	0	Do. Ornamental (per 1000)	50	0
Hip (per doz.)	4	0	Hip (per doz.)	4	0
Valley (per doz.)	3	0	Valley (per doz.)	3	6
Best "Hartshill" brand, plain sand-faced (per 1000)	50	0	Staffords. (Hanley) Reds or Brindled (per 1000)	42	6
Do. pressed (per 1000)	47	6	Hand-made sand-faced (per 1000)	45	0
			Hip (per doz.)	4	0
			Valley (per doz.)	3	6

WOOD.

BUILDING WOOD.	At per standard.					
	£	s.	d.		£	s.	d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	14	0	0	...	15	10	0
Deals: best 3 by 9	13	10	0	...	14	10	0

WOOD (*Continued*).

BUILDING WOOD (*Continued*).	At per standard.						
Battens: best 2½ in. by 7 in. and 8in., and 3 in. by 7 in. and 8 in.	£	s.	d.	...	£	s.	d.
	11	10	0	...	12	10	0
Battens: best 2½ by 6 and 3 by 6...	0	10	0	less than 7 in. and 8 in.			
Deals: seconds	1	0	0	less than best.			
Battens: seconds	0	10	0	»		»	
2 in. by in. and 2 in. by 6 in. ...	9	10	0	...	10	10	0
2 in. by 4½ in. and 2 in. by 5 in.	9	0	0	...	10	0	0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0	10	0	more than battens.			
¼ in.	1	0	0	»			
Fir timber: best middling Danzig or Memel (average specification)	At per load of 50 ft.						
	5	0	0	...	5	10	0
Seconds	4	10	0	...	5	0	0
Small timber (8 in. to 10 in.) ...	3	17	6	...	4	0	0
Small timber (6 in. to 8 in.).....	3	5	0	...	3	10	0
Swedish balks	2	12	6	...	3	0	0
Pitch-pine timber (30 ft. average)	4	10	0	...	5	5	0

JOINERS' WOOD.	At per standard.						
White Sea: first yellow deals, 3 in. by 11 in.	£	s.	d.	...	£	s.	d.
	24	10	0	...	25	10	0
3 in. by 9 in.	22	10	0	...	23	10	0
Battens, 2½ in. and 3 in. by 7 in.	17	0	0	...	18	0	0
Second yellow deals, 3in. by 11in.	19	0	0	...	20	0	0
» » 3 in. by 9 in.	18	0	0	...	19	10	0
Battens, 2½ in. and 3in. by 7 in.	14	0	0	...	15	0	0
Third yellow deals, 3 in. by 11 in. and 9 in.	14	0	0	...	15	0	0
Battens, 2½ in. and 3 in. by 7 in.	11	10	0	...	12	10	0
Petersburg: first yellow deals, 3 in. by 11 in.	21	10	0	...	22	10	0
Do. 3 in. by 9 in.	18	10	0	...	19	10	0
Battens	14	0	0	...	15	0	0
Second yellow deals, 3 in. by 11 in	16	10	0	...	17	10	0
Do. 3 in. by 9 in.	15	0	0	...	16	0	0
Battens	11	10	0	...	12	10	0
Third yellow deals, 3in. by 11 in.	13	10	0	...	14	10	0
Do. 3 in. by 9 in.	13	0	0	...	14	0	0
Battens	10	10	0	...	11	0	0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	15	0	0	...	16	0	0
» » 3 in. by 9 in.	14	0	0	...	14	10	0
Battens	11	10	0	...	12	10	0
Second white deals, 3in. by 11in.	14	0	0	...	15	0	0
» » 3 in. by 9 in.	13	0	0	...	14	0	0
Battens	10	10	0	...	11	0	0
Pitch-pine: deals	19	0	0	...	21	0	0
Under 2 in. thick extra	0	10	0	...	1	0	0
Yellow Pine—First, regular sizes	44	0	0	upwards.			
Oddments	32	0	0	»			
Seconds, regular sizes	33	0	0	»			
Oddments	28	0	0	»			
Kauri Pine—Planks per ft. cube.	0	3	6	...	0	5	0
Danzig and Stettin Oak Logs— Large, per ft. cube	0	3	0	...	0	3	9
Small » »	0	2	6	...	0	2	6
Wainscot Oak Logs, per ft. cube	0	5	6	...	0	6	0
Dry Wainscot Oak, per ft. sup. as inch	0	0	8½	...	0	0	9½
¼ in. do. do.	0	0	7	...		—	
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch..	0	0	10	...	0	1	1
Selected, Figury, per ft. super. as inch	0	1	6	...	0	2	6
Dry Walnut, American, per ft. super. as inch	0	0	10	...	0	1	0
Teak, per load	18	0	0	...	22	0	0
American Whitewood planks, per ft. cube	0	4	0	...	0	5	0
Prepared Flooring, etc.—	Per square.						
1 in. by 7 in. yellow, planed and shot	0	13	6	...	0	17	0
1 in. by 7 in. yellow, planed and matched	0	14	0	...	0	18	0
1¼ in. by 7 in. yellow, planed and matched	0	16	0	...	1	0	0
1 in. by 7 in. white, planed and shot	0	12	0	...	0	14	6
1 in. by 7 in. white, planed and matched	0	12	6	...	0	15	0
1¼ in. by 7 in. white, planed and matched	0	15	0	...	0	16	6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0	11	0	...	0	13	6
1 in. by 7 in. » »	0	14	0	...	0	18	6
¾ in. by 7 in. white » »	0	10	0	...	0	11	0
1 in. by 7 in. » »	0	12	9	...	0	15	0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton.						
Rolled Steel Joists, ordinary sections	£	s.	d.	...	£	s.	d.
	7	0	0	...	7	10	0
Compound Girders, ordinary sections	9	0	0	...	10	0	0
Steel Compound Stanchions	11	0	0	...	12	0	0
Angles, Tees, and Channels, ordinary sections	9	0	0	...	10	0	0
Flitch Plates	9	0	0	...	9	10	0
Cast Iron Columns & Stanchions, including ordinary patterns	7	10	0	...	8	10	0

METALS.

IRON—	Per ton, in London.						
	£	s.	d.	...	£	s.	d.
Common Bars	8	10	0	...	9	0	0
Staffordshire Crown Bars, good merchant quality	8	15	0	...	9	5	0
Staffordshire "Marked Bars"	10	10	0	...		—	
Mild Steel Bars	8	15	0	...	9	5	0
Hoop Iron, basis price	9	5	0	...	9	10	0
» » Galvanised	17	0	0	...		—	
(*And upwards, according to size and gauge.)							
Sheet Iron Black— Ordinary sizes to 20 g.	9	15	0	...		—	
» » 24 g.	10	15	0	...		—	
» » 26 g.	12	5	0	...		—	
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	15	0	0	...		—	
Ordinary sizes to 22 g. and 24 g.	15	10	0	...		—	
» » 26 g.	16	10	0	...		—	
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	18	0	0	...		—	
» » 22 g. and 24 g.	18	10	0	...		—	
» » 26 g.	20	0	0	...		—	

METALS (*Continued*).

IRON (*Continued*)—	Per ton, in London.						
	£	s.	d.	...	£	s.	d.
Galvanised Corrugated Sheets— Ordinary sizes, 6ft. to 8ft. 20 g.	14	10	0	...		—	
» » 22 g. and 24 g.	14	15	0	...		—	
» » 26 g.	16	5	0	...		—	
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. to 20 g. and thicker	12	0	0	...		—	
Best Soft Steel Sheets, 2 g. & 24 g.	13	0	0	...		—	
» » 26 g.	15	0	0	...		—	
Cut Nails, 3 in. to 6 in. (Under 3 in., usual trade extras.)	10	10	0	...	11	0	0

LEAD, &c.

		£	s.	d.	...	£	s.	d.
LEAD—Sheet, English, 4lb. and up		16	12	6	...		—	
Pipe in coils		17	2	6	...		—	
Soil pipe		20	2	6	...		—	
Compo pipe		20	2	6	...		—	
ZINC—Sheet—	In casks of 10 cwt.							
Vielle Montagne		31	0	0	...		—	
Silesian		30	12	6	...		—	
Zinc, in bundles, 1s. per cwt. extra.								
COPPER— Strong Sheet	per lb.	0	1	0	...		—	
Thin »	»	0	1	1	...		—	
Copper nails	»	0	0	10	...		—	
Copper wire	»	0	0	10	...		—	
BRASS— Strong Sheet	»	0	0	11	...		—	
Thin	»	0	1	0	...		—	
TIN—English Ingots	»	0	2	0	...		—	
SOLDER—Plumbers'	»	0	0	8½	...		—	
Tinmen's	»	0	0	11	...		—	
Blowpipe	»	0	1	2	...		—	

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

15 oz. thirds	2½d.	26 oz. fourths	3½d.
» fourths	1½d.	32 oz. thirds	5½d.
21 oz. thirds	3½d.	» fourths	4½d.
» fourths	2½d.	Fluted Sheet, 15 oz.	3½d.
23 oz. thirds	4½d.	» 21 oz.	4½d.

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.*

Per Ft., Delivered.

¼ Hartley's	2d.	Figured Rolled, Oxford Rolled, Oceanic, Arctic, Muffled, and Rolled Cathedral, white	3½d.
⅜ »	2½d.		
½ »	2¾d.	Ditto, tinted	5d.

* Not less than three crates.

OILS, &c.

		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	3	8
» » » in barrels	»	0	3	9
» » » in drums	»	0	3	11
Boiled » » in barrels	»	0	3	11
» » » in drums	»	0	4	2
Turpentine in barrels	»	0	4	0
» in drums	»	0	4	2
Genuine Ground English White Lead,	per ton	21	10	0
Red Lead, Dry	»	20	0	0
Best Linseed Oil Putty	per cwt.	0	11	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.

	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	6
Fine Elastic Carriage	0	12	0
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	10	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flating Varnish	0	18	0
White Pale Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	0
Berlin Black	0	16	0
Knotting	0	10	9
French and Brush Polish	0	10	6

TO CORRESPONDENTS.

NOTE.—All communications with respect to literary and artistic matters should be addressed to "THE EDITOR" (and not to any person by name); those relating to advertisements and other exclusively business matters should be addressed to "THE PUBLISHER," and *not* to the Editor.

All communications must be authenticated by the name and address of the sender, whether for publication or not. No notice can be taken of anonymous communications.

The responsibility of signed articles, letters, and papers read at meetings rests, of course, with the authors.

We cannot undertake to return rejected communications; and the Editor cannot be responsible for drawings, photographs, manuscripts, or other documents, or for models or samples, sent to or left at this office, unless he has specially asked for them.

All drawings sent to or left at this office for consideration should bear the owner's name and address on either the face or back of the drawing. Delay and inconvenience may result from inattention to this.

Any commission to a contributor to write an article, or to execute or lend a drawing for publication, is given subject to the approval of the article or drawing, when received, by the Editor, who retains the right to reject it if unsatisfactory. The receipt by the author of a proof of an article in type does not necessarily imply its acceptance.

N.B.—Illustrations of the First Premiated Design in any important architectural competition will always be accepted for publication by the Editor, whether they have been formally asked for or not.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the prepaid rate of 19s. per annum, with delivery by *Friday Morning's Post* in London and its suburbs.

To Canada, post-free, 21s. 6d. per annum; and to all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

Remittances (payable to J. MORGAN) should be addressed to The Publisher of "THE BUILDER," 4, Catherine-street, W.C.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursday*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l*. unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

AYLESBURY.—For alterations to the Infirmary, Aylesbury Union House, for the Guardians of the Aylesbury Union. Mr. F. Taylor, A.R.I.B.A., architect, 7, Bourlon-street, Aylesbury. Quantities by the architect:—

G. J. Fisher	£1,294	T. Higgs	£1,153
Webster & Cannon	1 258	J. Honour & Son, Ltd., Tring †	1,127
Mayne & Son	1,190		
W. T. Green & Co.	1,187		

BELFAST.—For alterations at 59, Old Market-street. Messrs. La Trobe & Weston, architects, 44, Corn-street, Bristol. Quantities by the architects:—

T. Broad & Son	£1,055	E. Walters & Son	£817
E. F. Woodward	1,000	F. W. Waters & Son	797
J. Baker & Sons	995	E. Love	789
C. A. Hayes & Sons	949	W. H. Roe	770
G. Downs & Son	920	W. Foster	765
Humphreys & Son	848	W. H. Roe‡	474
H. W. & E. I. Neale	837	W. Foster* ‡	445
W. Hendey	830		

‡ Revised tender.
[All of Bristol.]

BELFAST.—For erection of new church for St. Donard's Parish. Mr. E. H. Lingen Barker, architect, 10, Penbridge-mansions, Moscur-road, London, W. Quantities by Mr. G. Silvester:—

	Fabric, etc.	Tower.
W. Cochrane	£4,586	£958
Campbell & Son	4,258	880
Thornbury Bros.	4,188	854
McRoberts & Armstrong	4,163	925
Cony, Ltd.	4,145	842
Courtney & Co.	4,121	849
W. Dowell & Co.	4,077	880
J. & W. Stewart	4,004	798
J. Graham, Dromore ‡	3,992	844
McIntyre Bros.*	3,784	799

[All of Belfast except ‡.]

BLACKWOOD.—For Petty Sessional Court and Police Station, for Monmouthshire County Council. Mr. William Tanner, F.S.I., County Surveyor and County Architect, Newport:—

Hamilton & Millard	£3,770 0 0	C. H. Reed	£3,150 0 0
Jones Bros.	3,760 0 0	H. J. Herbert & Co.	3,140 0 0
T. W. & J. Jenkins	3,485 2 4	Poulton & Whiting	3,030 0 0
E. F. King & Co.	3,450 0 0	Kirby & Westacott	2,999 0 0
J. H. Williams	3,400 0 0	S. Edwards	2,990 0 0
Price Bros.	3,399 5 2	R. W. Moon, Newport*	2,990 0 0
R. Edwards	3,210 0 0		
E. C. Jordan & Co.	3,186 16 4		

CHURWELL.—For erection of a warehouse. Mr. T. A. Buttery, architect, 1, Basinghall-square, Leeds. Quantities by architect:—

Joiners: J. Pullan & Sons, Noster-house, Beeston*	£590 0 0
Plumber: F. Hargreaves, Elland-road, Churwell*	58 0 0
Plasterers: J. Iredale & Sons, Birstall*	28 17 4
Slaters: J. Atkinson & Son, Ltd., Leeds*	60 15 0

FROME.—For erection of a pumping station and refuse destructor, etc. Mr. F. W. Jones, A.M.Inst.C.E., Public Offices, Frome. Quantities by the Engineer:—

Contract No. 5.—Outfall Sewer, etc.

Hughes & Stirling	£3,823 7 9	Cooper & Co.	£2,667 4 11
C. Chamberlain	3,181 10 5	F. J. Seward	2,639 9 4
A. J. Catley	2,847 16 6	E. Ireland, Bath*	2,473 3 5
S. Wood	2,827 14 6	A. G. Collins & Co.	2,455 12 4
J. Riley	2,810 15 11		

Contract No. 6.—Destructor Buildings and Pumping Station.

Hughes & Stirling	£1,452 9 6	Hodder & Sons, Frome*	£1,054 14 5
C. Chamberlain	1,285 10 8	Heeman & Froude	1,054 14 5
F. J. Seward	1,142 17 11		
E. Ireland	1,142 12 3		

Contract No. 7.—Dwelling Houses.

Hughes & Stirling	£896 0	Hodder & Sons	£682 3
E. Ireland	888 3	F. J. Seward, Frome*	595 0
C. Barnes	708 3		

Contract No. 8.—Refuse Destructor, etc.

Meldrum Bros., Ltd.	£2,508 0 0
Goddard, Massey, & Warney	2,440 6 6
Heeman & Froude	2,189 0 0
Manlove, Alliott Co.	2,180 6 0
Hughes & Stirling	1,969 19 0
Horsfall, Ltd.	1,950 0 0
Dawson & Mansfield, Manchester*	1,893 0 0

Contract No. 9.—Pumping Plant.

[Not yet settled.]

HASTINGS.—For painting schools, for the Borough Council. The Borough Engineer, Town Hall, Hastings:—

Clive-vale School.

C. H. Cocks & Son, 165, Queen's-road, Hastings* £18 17

St. Matthew's School.

C. H. Cocks & Son, 165, Queen's-road, Hastings* £26 10

St. Helen's School.

W. F. Jenner, Priory-road, Hastings* ... £27 10

St. Leonard's School.

W. F. Jenner, Priory-road, Hastings* ... £31 13

Silverhill School.

A. E. Richford, 52, Mt. Pleasant-road, Hastings* £28 10

Tower-road School.

F. J. Pettit, Queen's-road, Hastings* ... £41 10

HIGH WYCOMBE.—For the enlargement of the County High School for Girls, High Wycombe:—

Rust & Ratcliffe	£2,230	C. H. Hunt & Sons	£1,971
J. Mead	2,198	Gibson & Sons	1,927
H. D. Bowyer	2,189	J. T. Harris, High Wycombe*	1,887
Webster & Cannon	2,148		
G. Biggs & Sons	2,080		

IRELAND.—For construction of a ferro-concrete bridge, for Wicklow County Council:—
J. & R. Thompson, Ltd, Roden-st., Belfast* £325

LEAMINGTON.—For alteration of premises, for Warwickshire Territorial Force Association. Mr. F. P. Trepess & Son, architects, Church-street, Warwick. Quantities by architects:—

A. Dankes	£2,169 5 10	J. S. Kimberley	£1,686 0 0
G. T. Smith & Sons	1,850 0 0	R. Bowen & Sons	1,680 0 0
R. Wallsgrove	1,762 13 5	J. Hope	1,621 0 0
D. Thomas & Son	1,711 0 0	R. P. Gathercole, Leamington*	1,556 14 0
T. Bailey & Co.	1,687 0 0		

LEIGH-ON-SEA.—For construction of a reinforced concrete roof. Mr. J. W. Liversedge, surveyor, Leigh-on-Sea:—

A. E. J. Price	£183 5 8	Lewis Rugg & Co., Queen Anne's Chambers,	
F. & E. Davey	180 0 0		
Yorkshire Hennebique Co.	165 7 10	S.W.‡	£126 4 11

‡ Recommended for acceptance.
[Surveyor's estimate, £125.]

LEYTONSTONE.—For the supply of furniture to County High School for Girls, Leytonstone, for the Leyton Advisory Committee of the Essex County Council. Messrs. William and John H. Jacques, architects, 2, Fen-court, E.C.:—

Musgrave & Co., Ltd.	£845 0 4
R. Stone & Sons, Ltd.	833 4 8
North of England School Furnishing Co.	732 10 7
T. Bradford & Co.	692 11 6
Summerscales, Ltd.	675 6 0
G. E. Hawes & Sons	658 4 6
Bennet Furnishing Company, Ltd.	641 14 9
Educational Supply Association, Ltd.	620 6 0
T. E. Sugden	615 10 6
Kingfisher, Ltd.	613 19 1
Wake & Dean, Ltd.*	591 8 6

LONDON.—For laying of a main to carry unfiltered water from Southbury-road to Bush-hill basin and a 48-in. main to carry water over Maiden's Brook, for the Metropolitan Water Board:—

T. W. Pedrette	£12,156 14 0
J. Aird & Sons	11,133 19 6
G. Bell & Sons, Ltd.	10,805 0 0
R. C. Brebner & Co.	10,784 1 0
J. Dickson	10,337 0 0
Kirk & Randall	10,097 0 0
T. Docwra & Son*	9,186 5 10

MACCLESFIELD.—For erection of a school in Athey-street, for the Local Education Authority. Messrs. Whittaker & Bradburn, architects, Macclesfield. Quantities by the architects:—

Gorton & Wilson	£9,985	J. Gerrard & Sons, Ltd.	£9,650
J. T. Scattergood & Sons	9,865	G. Roylance & Co., Ltd., Macclesfield†	9,374
Smith Bros., Ltd.	9,738		
G. Simpson & Son	9,700		

NANTYGLO.—For erection of an institute and library, for the Trustees and Committee. Mr. W. W. Neat, architect, 70, King-street, Brynmawr, Mon.:—

J. Morgan	£1,287	J. W. Jenkins, Brynmawr*	£1,065
H. Havard	1,205		
T. E. Graham	1,182		

NIGG.—For construction of a landing-slip at Cromarty Ferry, for Cromarty Estate:—

A. Chisholm	£309 14 0
R. Fraser, Inverness*	215 8 3

SLIGO.—For alterations to stores on Quay, for Colonel Wood-Martin, Sligo. Messrs. Chute & Fowler, Civil Engineers, Sligo:—

G. Kerr, Sligo	£278 10

SLIGO.—For repairs to grammar school, Sligo, erecting new copings, for the Incorporated Society for Promoting Protestant Schools in Ireland. Messrs. Chute & Fowler, Civil Engineers, Sligo:—

C. Connally	£120 0	G. Williams, Sligo*	£101 17

TREFOREST.—For erection of a bridge. Mr. W. E. Lowe, Engineer and Surveyor, Municipal Buildings, Pontypridd:—

Masonry Work.

E. H. Page	£3,067 14 2	A. G. Collins & Co.	£1,727 16 0
G. L. Morgan	2,613 0 3	H. Murray	1,711 0 0
W. Jenkins	2,112 17 4	R. Webb & Sons	1,707 0 11
R. Pomeroy & Co.	2,030 16 1	Hyslop & Co., Oswaldwhistle*	1,562 13 10
Smith, Jones, & Sons	1,942 11 9		

Ferro-Concrete Work.

W. Thomas & Co.	£1,696 1 1	Yorkshire Hennebique Contracting Co.	£1,265 0 0
G. Palmer	1,518 8 1		
Lambrick & Co.	1,339 18 5	E. H. Page, Queen-street, Cardiff*	1,190 19 5
Playfair & Toole	1,314 0 0		
G. L. Morgan	1,300 16 4		
Hobrough & Co.	1,280 3 0		

TRING.—For painting at the Isolation Hospital, for Tring Urban District Council. Mr. S. S. Gettings, surveyor, Tring:—

Hedges & Son	£119 2 6
Honour & Son, Ltd.	108 12 6
S. M. Knight*	103 10 8

[All of Tring.]

Ham Hill Stone.
Doulting Stone.
Portland Stone.
The Ham Hill and Doulting Stone Co., Limited
(incorporating the Ham Hill Stone Co. and C. Trask & Son, The Doulting Stone Co.).
Norton, Stoke-under-Ham, Somerset.
London Agent:—Mr. E. A. Williams, 16, Craven-street, Strand.

USE
WHITE
LIME-SAND BRICKS
Of the Finest Quality
FOR
BUILDINGS, TUNNELS, CELLARS, MANHOLES, etc.
WHY?
B The Bricks are uniform.
E Less mortar is required.
C Closer joints can be made.
A 15 per cent. more bricks can be laid per day.
U Where light is required they need no whitewashing.
S Saving of material and labour.
E USED BY THE MILLION IN GERMANY, AMERICA, AND IN THIS COUNTRY.
These Bricks are made by the
GODSTONE BRICK & TILE CO., LTD., Oxted Road, Godstone, Surrey,
and can be delivered in quantities of not less than 5,000 within 10 miles of the Company's Works at 26/- per 1,000, net.
Send for Free Samples.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 42, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds and milk-rooms, granaries, tun-rooms, and terraces. Asphalte Contractors to the Forth Bridge Co.

SPRAGUE & CO., Ltd.,
LITHOGRAPHERS AND PRINTERS.
Estate Plans and Particulars of Sale promptly executed.
4 & 5, East Harding-st., Fetter-lane, E.C.

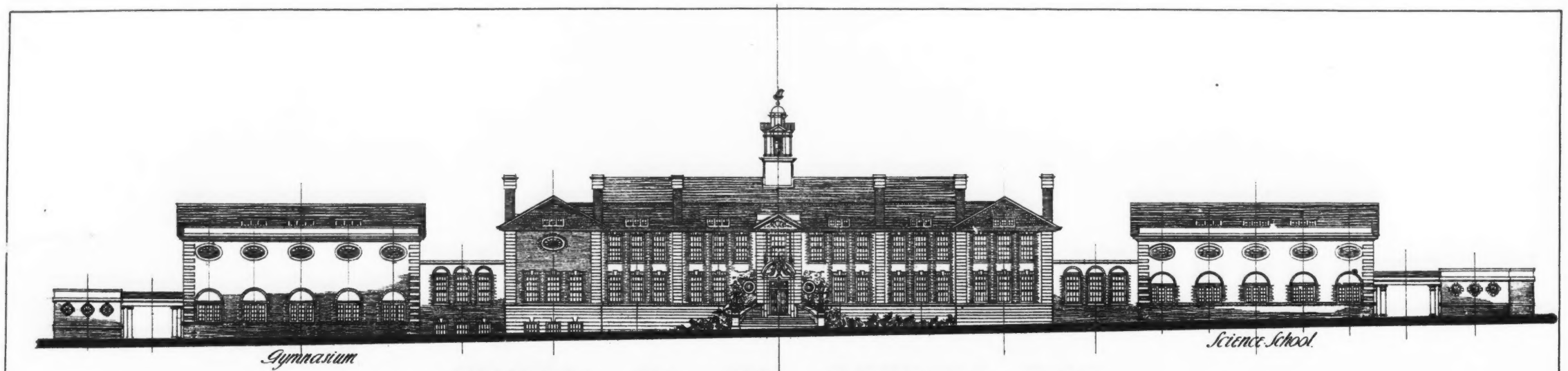
JOINERY,
Of every description and in any kind of Wood.
CHAS. E. ORFEUR, LTD.,
ESTIMATES ON APPLICATION.
COLNE BANK WORKS, COLCHESTER.
Telephone: 0195. Telegrams: "Orfeur, Colchester."

ASPHALTE
For Horizontal & Vertical Damp Courses.
For Flat Roofs, Basements, & other Floors.
The best materials and workmanship are supplied by
THE
French Asphalte Co.
Whose name and address should be inserted in all specifications.
For estimates, quotations, and all information apply at the Offices of the Company,
5, LAURENCE POUNTNEY HILL, CANNON STREET, E.C.

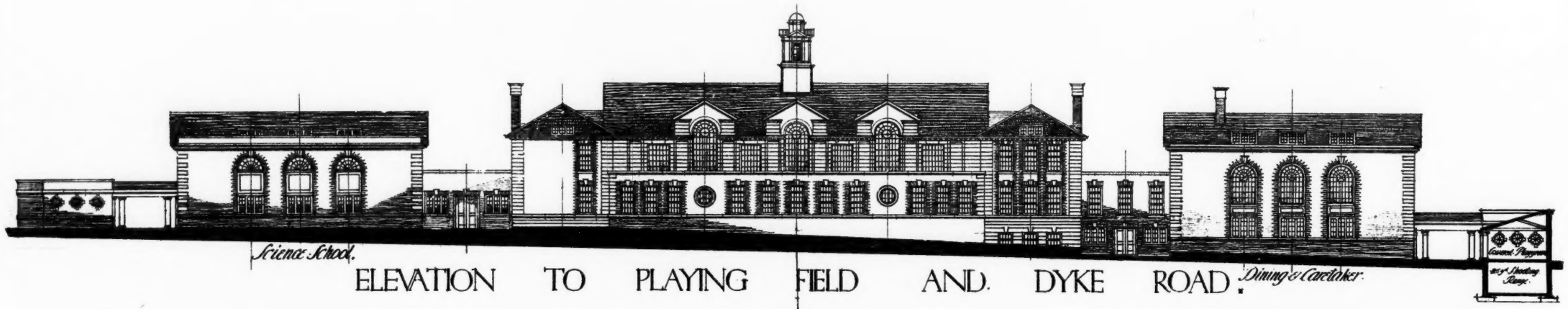
OGILVIE & CO., Telephone: DALSTON 1382.
Many years connected with the late firm of W. H. LASCELLES & CO., LTD., of Bunhill Row.
Amhurst Works, DALSTON LANE, N.E.
EXPERTS IN HIGH-CLASS JOINERY.
ALTERATIONS AND DECORATIONS. ESTIMATES FREE.

J. J. ETRIDGE, Jr.
SLATE MERCHANTS. LTD.,
EXPERTS IN
SLATING, TILING.
BEST WORK ONLY.
Telephone 2685 Wall, or write
BETHNAL GREEN SLATE WORKS,
BETHNAL GREEN, LONDON, E.

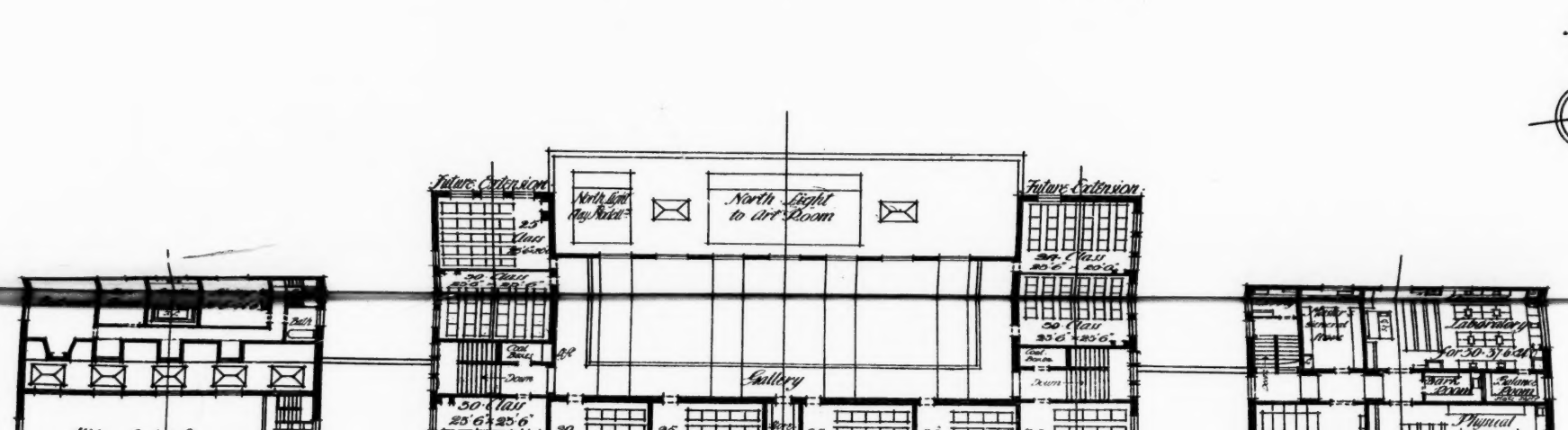
EWART'S
Cures in 19 cases out of 20.
"EMPRESS"
Write to-day for Illustrated Catalogue Free to
EWART & SON Ltd.,
346-350, Euston Road, London, N.W.
Established 1834.
Telephone: 2570 North.
SMOKE-CURE

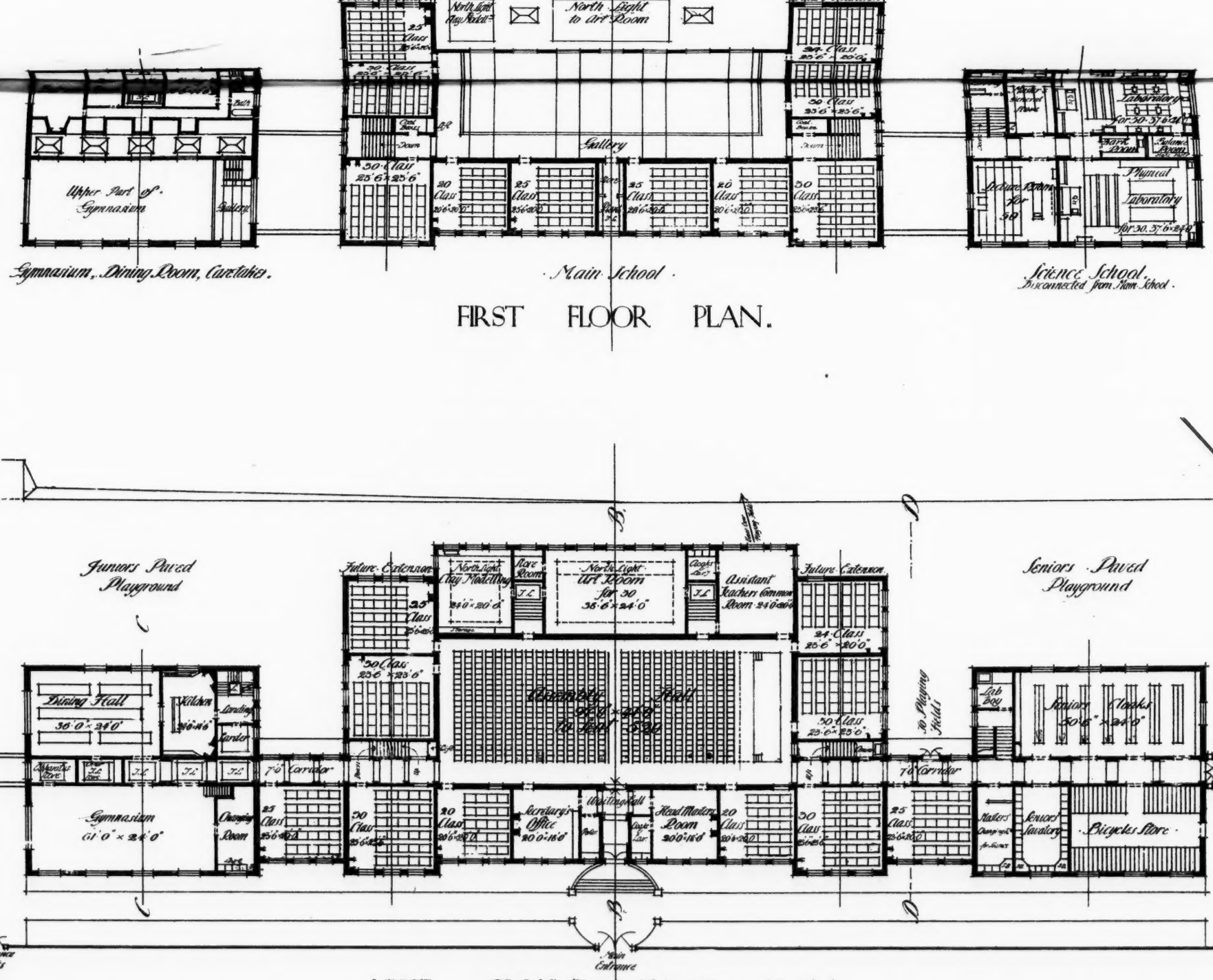


ELEVATION TO OLD SHOREHAM ROAD.



ELEVATION TO PLAYING FIELD AND DYKE ROAD.



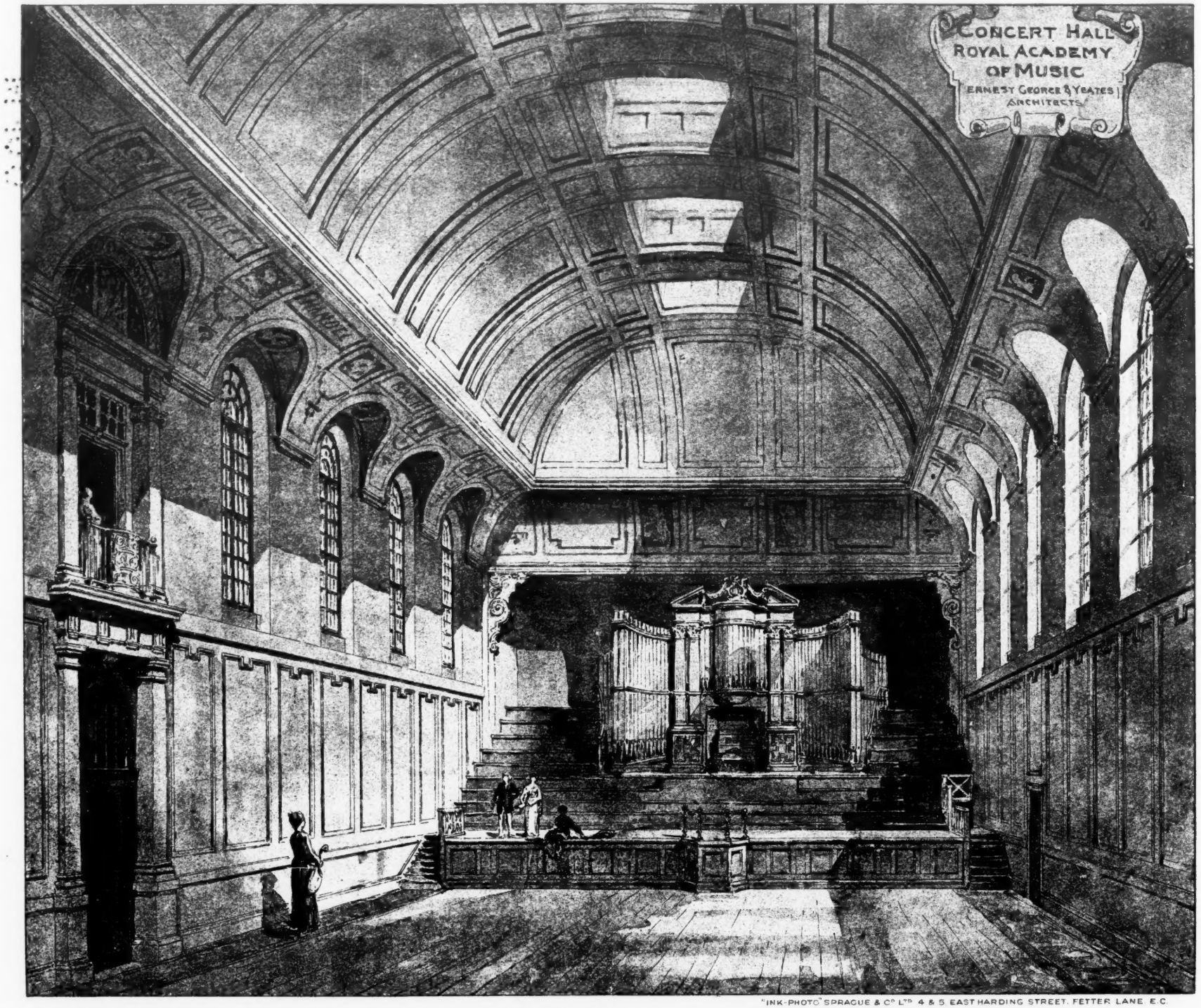


FIRST FLOOR PLAN.

UPPER GROUND FLOOR PLAN.

PHOTO-LITHO. SPRAGUE & Cº Lᵗᵈ 4 & 5. EAST HARDING STREET. FETTER LANE, E.C.

COMPETITION DESIGN FOR BRIGHTON, HOVE, AND SUSSEX GRAMMAR SCHOOL.—By Mr. Edwin Cooper.



"INK-PHOTO" SPRAGUE & Co LTD 4 & 5 EAST HARDING STREET, FETTER LANE E.C.

THE CONCERT HALL, ROYAL ACADEMY OF MUSIC.—Messrs. Ernest George, A.R.A., & A. B. Yeates, F.R.I.B.A., Architects

Royal Academy Exhibition, 1911.

BRIGHTON, HOVE AND SUSSEX

BRIGHTON, HOVE AND SUSSEX GRAMMAR SCHOOL.

Section through Class Rooms.

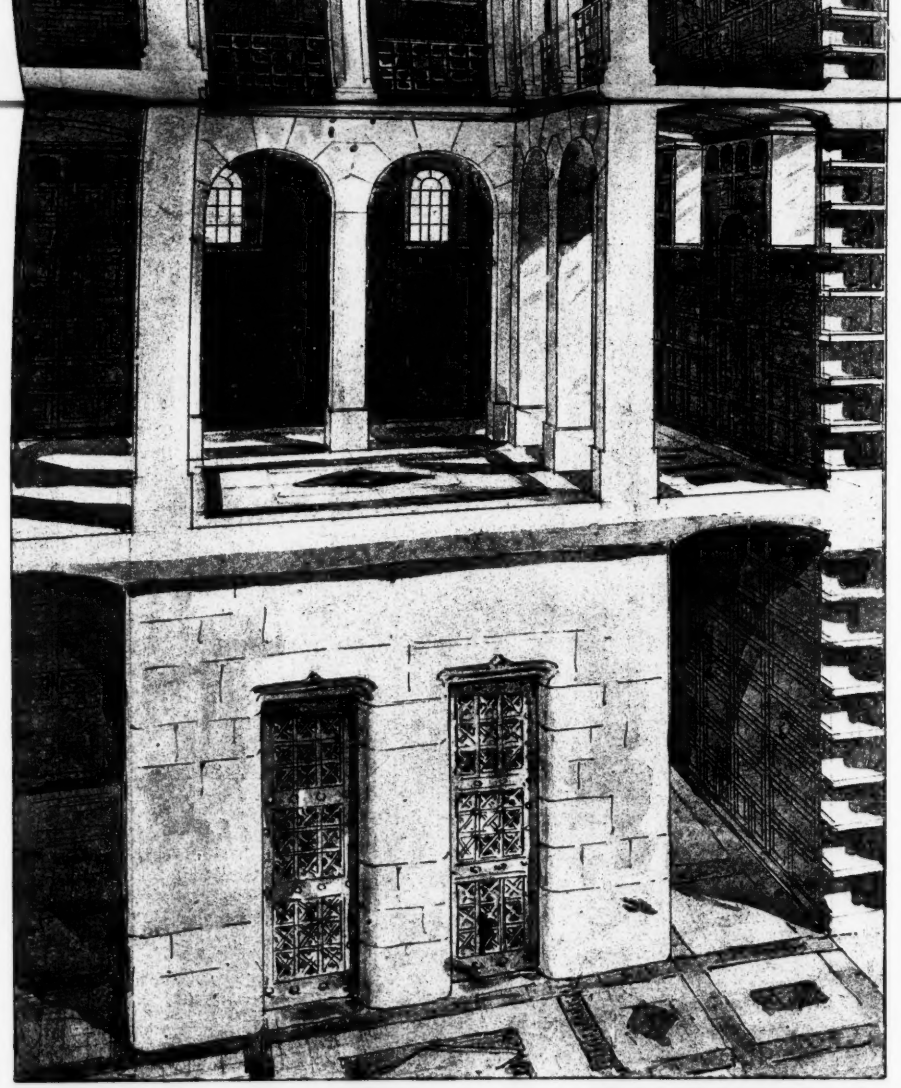
Section through Main Entrance.

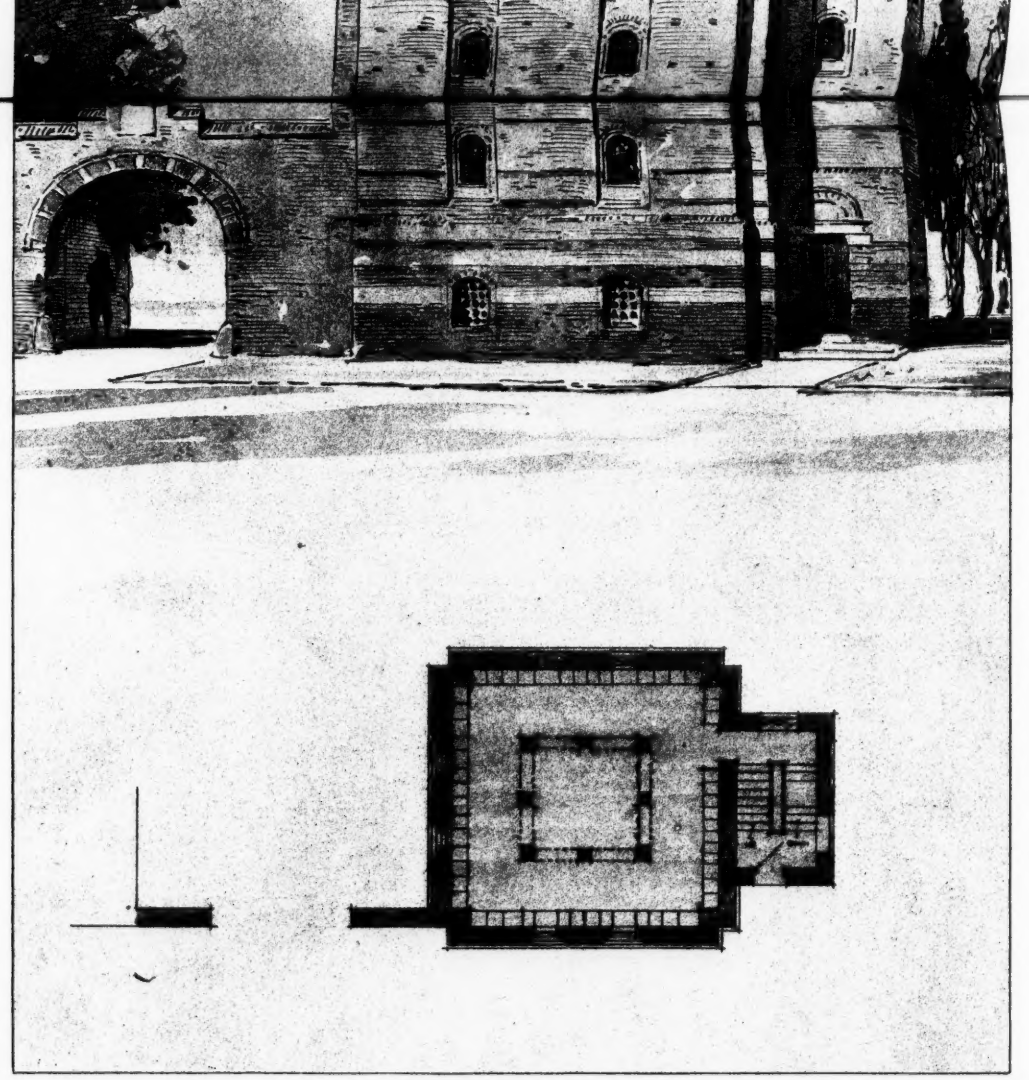
DETAIL OF MAIN ENTRANCE.

"INK PHOTO" SPRAGUE & Co LTD 4 & 5, EASTHARDING STREET FETTER LANE E.C.

COMPETITION DESIGN FOR BRIGHTON, HOVE, AND SUSSEX GRAMMAR SCHOOL.—By Mr. Edwin Cooper.

COLUMBARIUM
FOR THE CREMATORIUM
GOLDERS' GREEN.
ERNEST GEORGE & YEATES
ARCHITECTS.





"INK-PHOTO" SPRAGUE & Cº LTD 4 & 5, EAST HARDING STREET, FETTER LANE E.C.

THE COLUMBARIUM OF THE CREMATORIUM, GOLDER'S GREEN.—Messrs. Ernest George, A.R.A., & A B. Yeates, F.R.I.B.A., Architects.

Royal Academy Exhibition, 1911.